ENGINEERING NEWS-RECORD

A McGRAW HILL PUBLICATION

SAN DIEGO COUNTY GENERAL HOSPITAL
Laundry Building, San Diego, California
E. L. FREELAND, Structural Engineer
J. L. GLENN, Mechanical Engineer
SHAFER PLUMBING CO., Mechanical Contractor

To ban piping ills here . . . virtually every service is BYERS WROUGHT IRON

One of the most important hospital facilities is the laundry—and because of the number and type of the piping services, careful specification is essential to avoid high maintenance. In this new building, the designers took every precaution to assure long piping life. Steam supply and returns, raw water supply, circulating hot water lines, air lines, soap lines and hot and cold water lines, are all Byers Wrought Iron. Sizes range from ½-in. to 6-in., in both black and galvanized wrought iron pipe.

Maintenance records provide plenty of examples of the consequences of using non-durable materials in these services—and of the wisdom of using wrought iron. In a number of historical instances, wrought iron installed in some of the services mentioned is still on the job after 40 to 50 years of trouble-free performance.

Our booklet, THE A B C's OF WROUGHT IRON digests an interesting story of what wrought iron is, how it is made, why it resists corrosion so well, and where it can be profitably used. May we send you a copy?

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WHY WROUGHT IRON LASTS

This notch-fracture test specimen illustrates the unusual fibrous structure of wrought iron—which is responsible for the unusual corrosion resistance of the material. Tiny threads of glass-like silicate slag, distributed through the body of high-purity iron, halt and disperse corrosive attack, and discourage pitting and penetration. They also anchor the initial protective scale, which shields the underlying metal.

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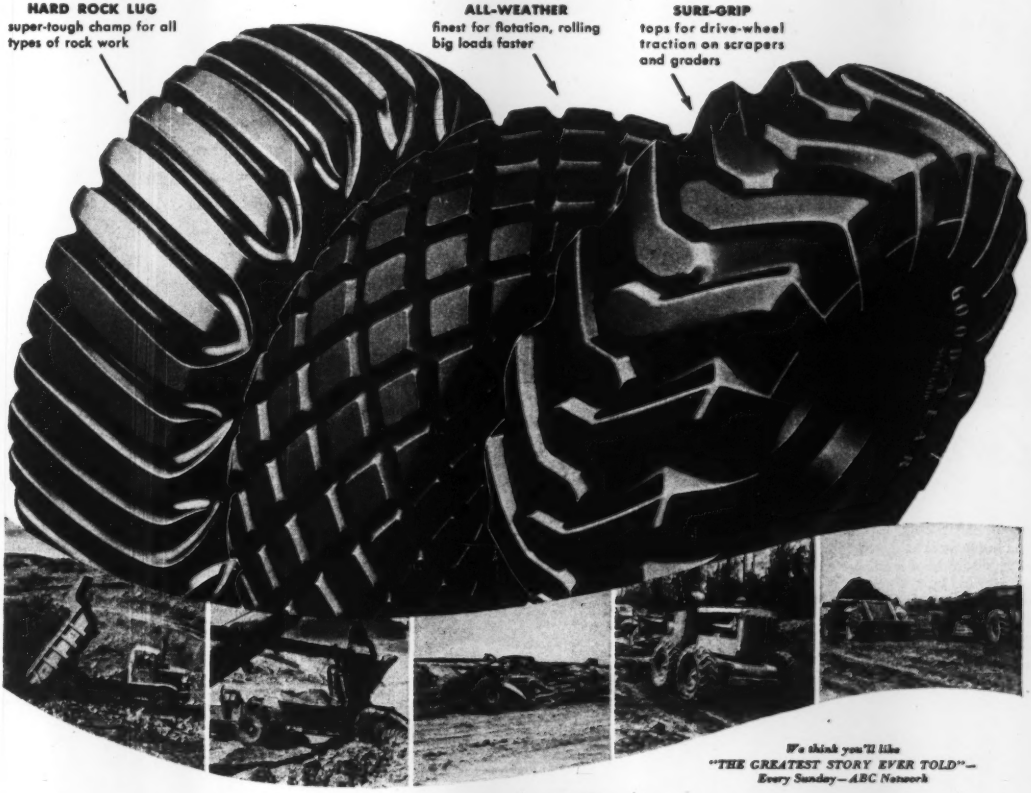
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ENGINEERING NEWS-RECORD

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Volume 146 — MARCH 15, 1951 — No. 11

WALDO G. BOWMAN
Editor

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Number of copies of this issue printed 45,597

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Domestic News Bureaus—Atlanta, Chicago, Cleveland, Detroit, Houston, Los Angeles, San Francisco, Washington. Correspondents in 71 cities in the United States, Canada and Mexico.

Foreign News Bureaus—Loncon, Frankfurt, Paris, Moscow, Tokyo, Bombay, Melbourne, Rio de Janeiro, Mexico City, *Correspondents*—Athens, Rome, Caracas, Buenos Aires, Santiago, Shanghai, Zurich, Johannesburg and 40 other cities.

ROBERT F. BOGER
Publisher

March 15, 1951 — ENGINEERING NEWS-RECORD — Vol. 146—No. 11

Member ABC and ABP

Published weekly by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948), Founder. **Publication Office, 99-129 North Broadway, Albany 1, N. Y.**

Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 18, N. Y. Curtis W. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President, Publications Division; Ralph B. Smith, Editorial Director; Nelson Bond, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Director of Circulation.

Subscriptions: Address correspondence to Engineering News-Record—Subscription Service, 99-129 N. Broadway, Albany 1, N. Y., or 330 W. 42nd St., New York 18, N. Y. Allow ten days for change of address.

Please indicate position and company connections on all subscription orders.

Single copies 35¢. Subscription rates—United States and possessions, $6.00 a year; $9.00 for two years; $12.00 for three years. Canada, $8.00 a year; $12.00 for two years; $16.00 for three years. Pan American countries, $10.00 a year; $16.00 for two years; $20.00 for three years. All other countries, $20.00 a year; $30.00 for two years; $40.00 for three years. Entered as second class matter October 29, 1936, at the Post Office at Albany, N. Y., under Act of Mar. 3, 1879. Printed in U. S. A.

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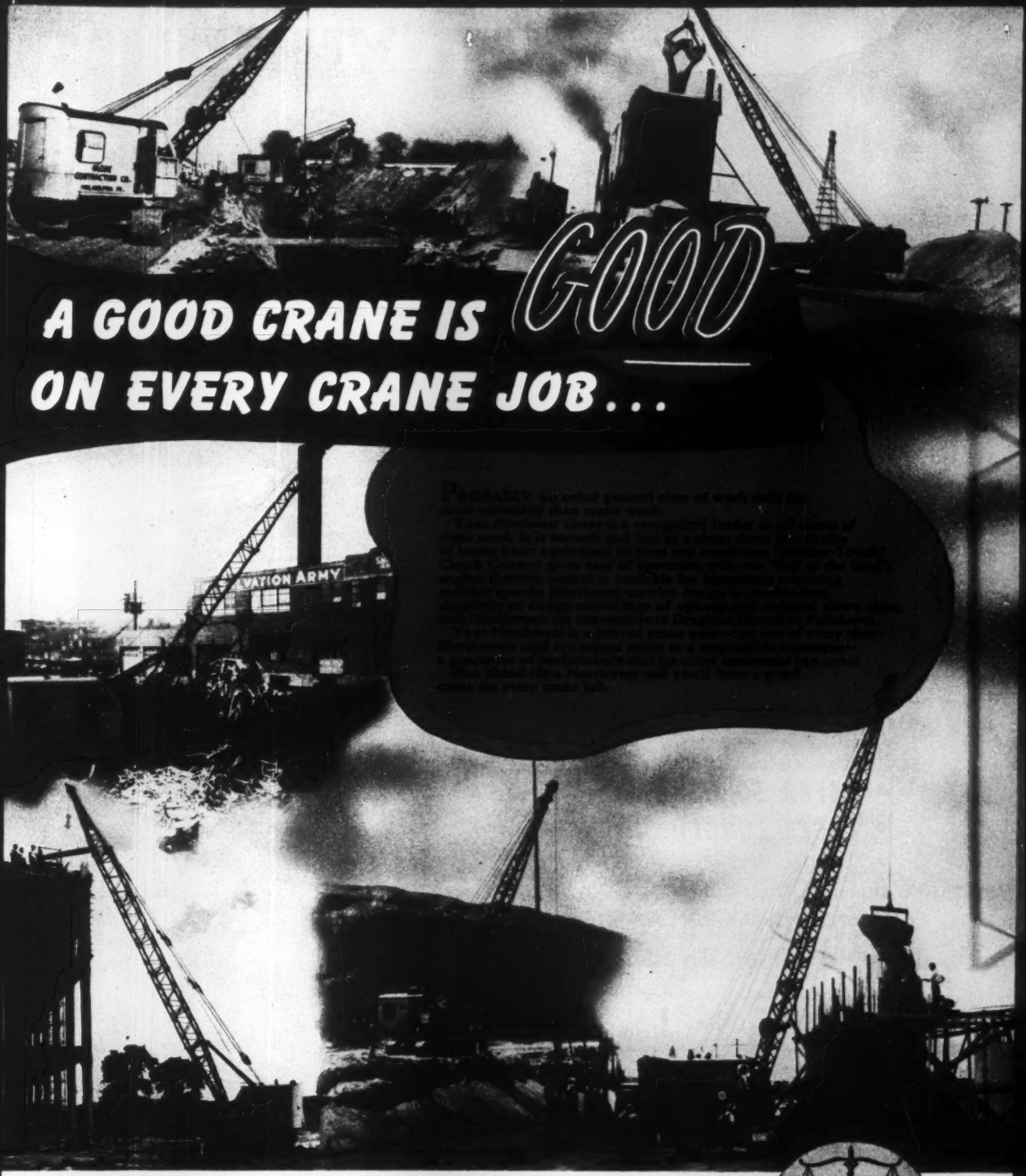
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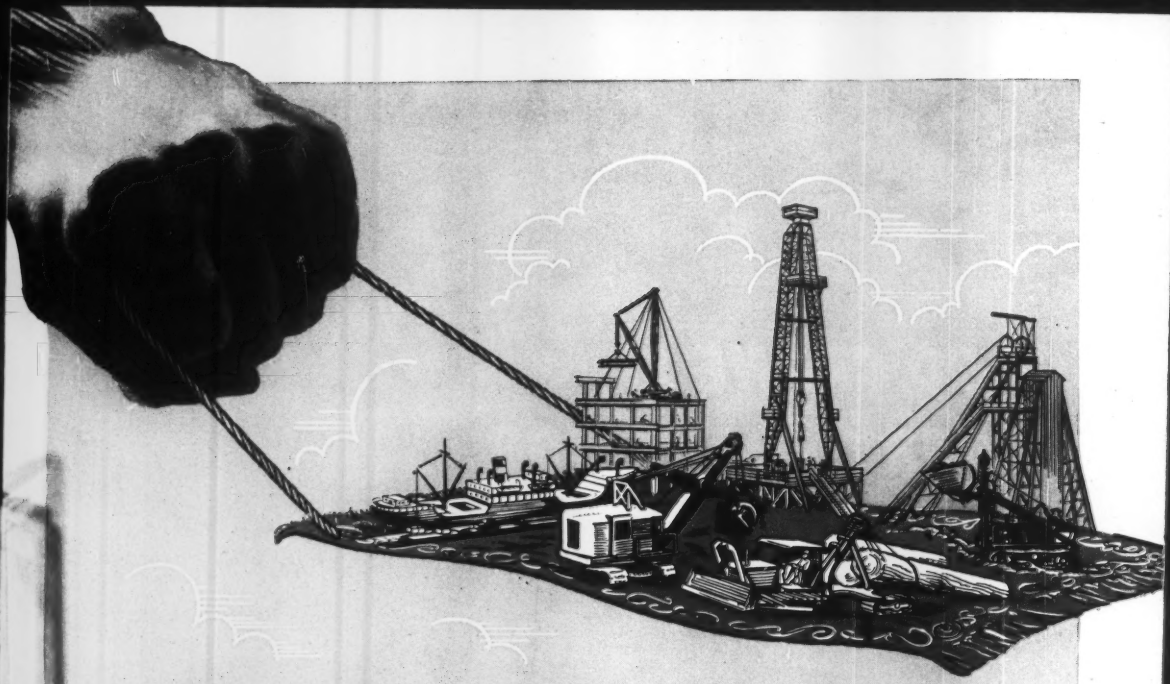

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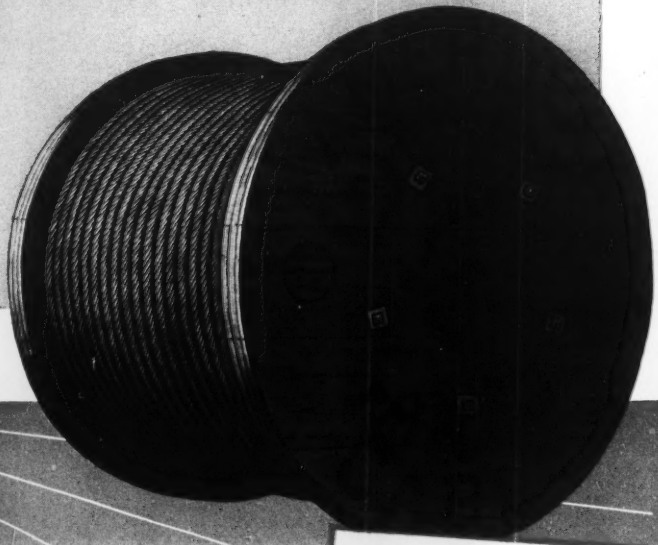

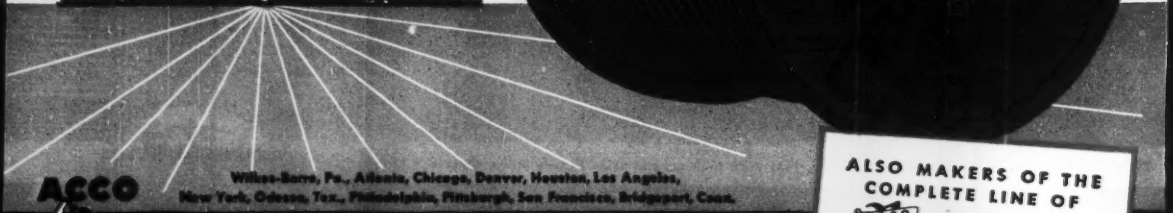

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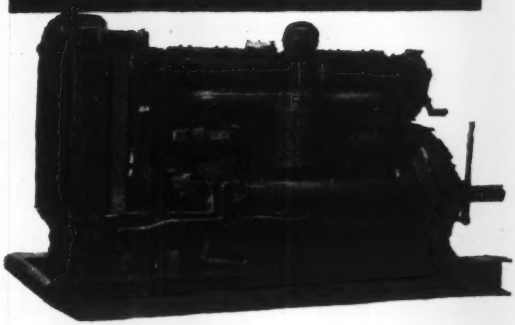

"Plenty of air when you need it" requires "plenty of power" and it has to be the right kind of power . . . dependable, economical and responsive—and that's just the kind you get with Murphy Diesels. The job on which the photograph above was made is a good example of the need for good power and plenty of air. In the salt marshes on the New Jersey Turnpike four Murphy Diesel powered 600 cu. ft. Le Roi compressors supply air used to fill 80 ft. casings with sand under pressure.

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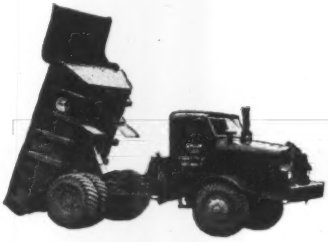

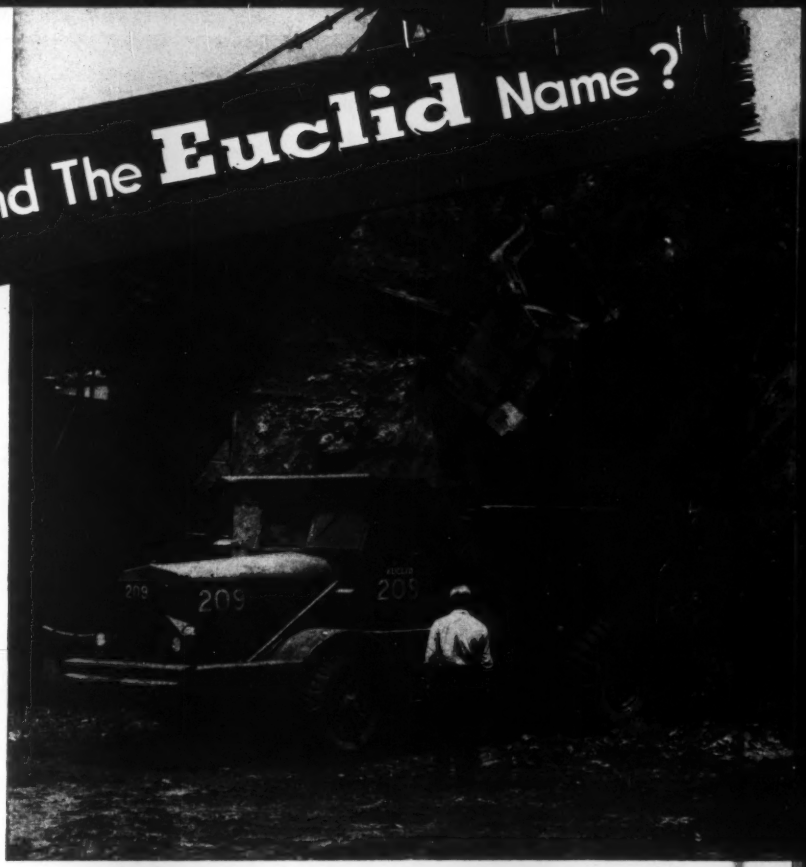

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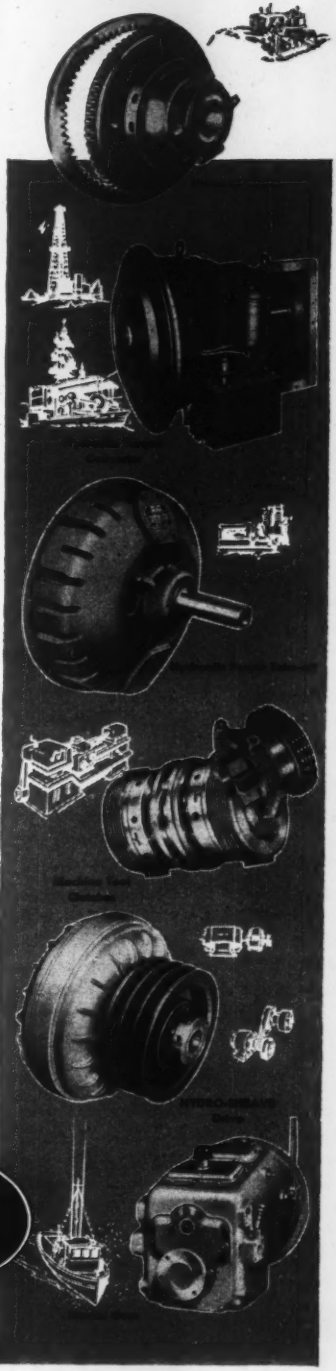

Thirty-two years ago, one of the weakest points in many machines was the vital connecting link between driving and driven units. This isn't true today.

Now, wherever you see power at work — in factories, in oil fields, in construction camps, in the logging country, in boats — the transmission of power to start the work cycle is merely a matter of *touch . . . and GO.*

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In its 32 years, too, Twin Disc has pioneered in hydraulic power transmission — today offers the nation's most complete line of hydraulic torque converters and hydraulic couplings for industrial application.

So, whatever your problem in "touch and GO" power transmission may be, let Twin Disc Engineers submit a recommendation. Their experience and the facilities behind them are unexcelled in the industrial power transmission field.

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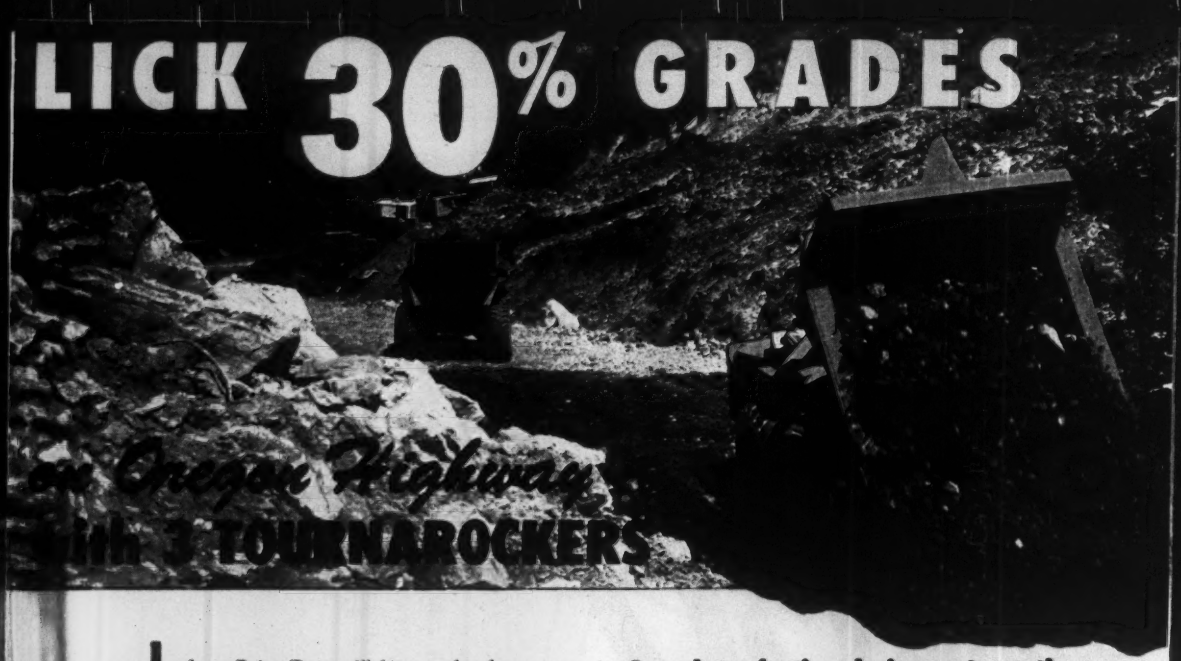

on Oregon Highways with 3 TOURNAROCKERS

Lookout Point Dam will be completed across the Middle Fork of the Willamette River near Lowell, Oregon, in 1953. One section of work now in progress involves relocating 2 miles of State Highway 58 and 2 miles of Southern Pacific rail line above the reservoir area at Goodman Bluff. Approximately 1,236,000 cu. yds. of rock and 917,000 cu. yds. of common earth have to be moved . . . most of it from canyon slopes ranging from 1:1 to vertical. Leonard & Slate Oregon Ltd. and E. C. Hall Co. of Portland share the 2,153,000-yd., 18-month federal contract . . . and have assigned the most difficult hauling on it to 3 LeTourneau 16-ton, rear-dump Tournarockers. Here's typical performance:

On one section of the job, the Tournarockers have 400′ of one-way travel down 30% grade . . . 1000′ along existing highway through heavy traffic . . . and 200′ on the rough unfinished fill. The entire 0.3 mi. stretch is narrow and winding . . . there are some delays for traffic . . . and "elbow room" at both shovel and dump is severely limited . . . yet each "C" completes a 3200′ cycle every 7 minutes.

3 units move 288 yds. hourly

Average haul speed, including complete stops for one-way traffic, is 9.8 m.p.h. . . . and average shovel-load is 12 pay yards. In one hour, each Tournarocker makes 8 trips . . . delivers 96 pay yards. This time study figure checks closely with over-all job production records, which show that on similar hauls, with 2 Tournarockers handling output of one shovel, each LeTourneau rig has been averaging approximately 125 yards per hour.

Speed production during wet weather

One of the biggest problems on the Lookout Point job is the rainy season, which is usually 6 months long. Clay in the gravel-clay mixture is extremely slippery when wet, and makes a serious problem on the steep, narrow and winding haul roads. To meet these conditions, Tournarockers offer a number of distinct advantages. Their big 21.00 x 25 low-pressure tires improve traction. Power-proportioning differential applies up to 4 times more power to the wheel on firmest footing. Positive power steer shifts footing as needed for better pull. Powerful 4-wheel air brakes and Electrotarder provide ample braking action on steep grades. Front-wheel drive on prime mover lets the "C's" dump safely over the edge of fills because drive wheels are always on firm ground. Simple electric hoist raises body to vertical position . . . streamlined bowl clears even the wettest, stickiest loads in a few seconds.

Important savings for you

These same Tournarocker features which are helping Leonard & Slate and E. C. Hall lick steep slopes and rough going on this Oregon project, offer new low-hauling costs for your jobs, too. Ask your LeTourneau Distributor about this 16-ton, rear-dump hauler. He can also give you complete information on 9, 35 and 50-ton Tournarockers. You get both job and profit insurance with all Tournarocker sizes, because you can use the 2-wheel prime mover to power other interchangeable units, including Carryall Scrapers, bottom-dump hoppers, flat-beds, haulers, and cranes. Call him, or write TODAY.

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NEWS BRIEFS

Decentralization—In keeping with the idea of decentralization of industry as a part of the defense plan, several of New England's big manufacturers are scouting for locations away from the so-called air bomb target areas. The Smith & Wesson Co., Springfield, Mass., large manufacturer of revolvers, has already gone underground, having moved from its plant in the center of the city to a bomb-proof place about seven miles out in the suburbs, where there is a maze of underground, concrete-lined tunnels. It is said that concerns that have moved their plants away from congested cities, have found operating costs lower and working and living conditions better for the employes. Some of the larger concerns are splitting up their different manufacturing departments, and have an assembly plant some distance away, thus eliminating the danger of having the whole works wiped out.

Mile-long conveyor—Gilbert Nelson, president of the Sugar Island Development Corp., is considering plans for a conveyor belt a mile in length at Sault Ste Marie, Mich. Project would include loading docks at each end. It is being planned as an emergency defense measure to assure transportation of iron ore to steel mills, if the Soo Locks should be put out of commission. The belt would parallel the St. Marys River.

New state maps—Publication of the first five of a new series of state base maps has been announced by Oscar L. Chapman, Secretary of the Interior. The five maps are of New Jersey; Rhode Island-Connecticut; Maryland-Delaware; Wyoming; and Oklahoma. Available soon will be maps of four other states—Illinois, Indiana, Iowa and Mississippi. Inquiries should be directed to the Director, Geological Survey, Washington 25, D. C.

Don't park too close—In Missouri it will be illegal to park cars less than 3 ft apart if a bill by Representative F. C. Mazzuca is enacted by the state legislature. The measure would also require bonds for parking lot attendants, and the carrying of liability insurance by lot operators.

Dentists' paradise—As the result of a survey which revealed that Seattle children have a dental attack rate about 50 percent higher than the national average, Dr. Emil E. Palmquist, director of the City-County

(*Continued on page 13*)

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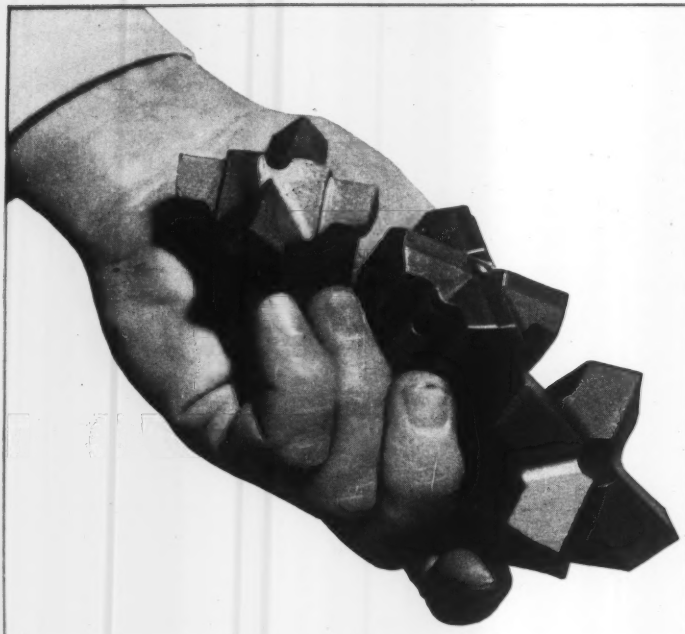

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So, whether you're looking for lower bit cost, lowest cost per foot of hole drilled, greatest possible drilling speed, or any other advantage, chances are our rock bit engineers can help you get it. For information and help, contact The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

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Department of Public Health, has recommended that the city council begin at once the treatment of the water supply with fluorine. The program, estimated to cost at least $75,000 annually for materials, has the endorsement of both the Seattle District Dental Society and the King County Medical Society. The survey was made among 6,000 school children by the Seattle District Dental Society, the Seattle Council of Parent-Teacher Associations and Seattle Public Schools. Seattle long has been known as a dentists' paradise, since its soft snow-fed water supply lacks minerals beneficial to teeth.

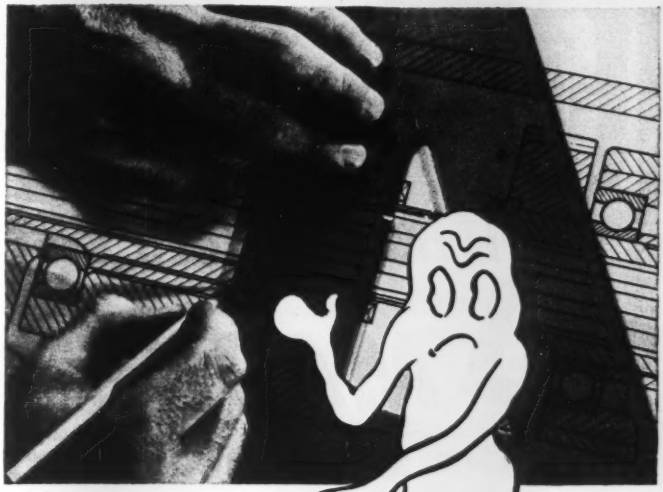
Fire vs. water—Power lines and a control board from which concrete batching and mixing operations were handled suffered severe damage in a recent fire at Philpott Dam in south-central Virginia. Bates & Rogers Construction Co., contractors on the $13,000,000 Corps of Engineer structure, estimated damage at near $95,000.

Aerial transport—An interesting application of aerial transport in the construction field is revealed by the recent decision to speed the building of the new railway from Seven Islands on the Gulf of St. Lawrence to the new Labrador iron ore deposits by constructing at once an airfield about 11 miles north of the coast line. This will permit access of working forces and machinery this winter, without waiting for the spring break-up. As soon as the temporary landing strip is ready, shovels, bulldozers and other heavy equipment will be disassembled, flown in, and then reassembled for work on the urgent task of building this strategic railway line. The present international conditions, and the critical North American steel situation, is said to be responsible for trying out this method of quick transit in the construction field.

Delaware River basin plan—The Interstate Commission on the Delaware River Basin has submitted to legislatures of New York, New Jersey, Pennsylvania and Delaware its final plan for developing basin resources. Incodel asks that the states create a commission to finance and construct the project, and wants full approval of the scheme by 1953 legislatures. For details see ENR Feb. 2, 1950, page 25.

Cross purposes—Maine levies a six-cents-a-gallon tax on gasoline used by motor carriers on its roads but bought outside of the state. A retaliatory measure has been enacted by the neighboring state of New Hampshire. At a recent legislative hearing on a

(Continued on page 15)



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Here's tough, all-welded construction to take abuse in stride . . . extra stability so you can use all the power you need . . . speed and smooth operation in every function to give you maximum output.

MAGNETORQUE ELECTRIC SWING gives you faster swing, more accurate control with less strain on machine and operator. No more swing frictions with their adjustments and replacement costs.

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*T. M. of Harnischfeger Corporation for electro-magnetic type clutch.

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proposed repeal of the Maine impost was a spokesman for the Bangor & Aroostook Railroad.

Needed—more sand—Hawaii is spending $1,000,000 to make Waikiki more like the beach tourists think it is. The Honolulu beach, famous for its long rolling surf, will be widened to about 150 ft by bringing in sand from the other side of Oahu island. James W. Glover Ltd. is the contractor for the job.

When good fellows get together—When the Canadian Construction Association consulted with Ottawa architects as to the selection of an architect for the design of the proposed C. C. A. head office building, the leading firms of architects in the Canadian capital had a private meeting and then offered to act jointly on the project.

Wants to pay out $8,500—N. Y. State Department of Public Works is trying to find the missing owners of 17 parcels of land which have been taken over by the state on the site of the proposed state office building campus, a 430-acre tract near the west city limits of Albany. The state is prepared to pay out $8,500 to the owners if they can be found, so that the title can be cleared up.

The Cover

Typical American success story is that of Paul B. Reinhold, president and treasurer of the Atlas Equipment Corp. of Pittsburgh, Pa., and seated this week as president of the American Road Builders Association.

Actively interested in good roads for many years, he has been first vice-president of the ARBA and has headed and served on many of its most important committees. He heads the committee on highways and bridges of the Pittsburgh Chamber of Commerce, and has served as chairman of the National Express Highway Committee.

Born in Marietta, Pa., May 7, 1890, Mr. Reinhold was educated at Lehigh University. For ten years after graduation (in 1913) he was with the Crucible Steel Co. of America in charge of marketing. In 1923 he formed Reinhold & Co., Inc., in Pittsburgh to market crushed stone and limestone products for highway and public works construction. In 1935 he formed the Atlas Equipment Corp. to specialize in the marketing of industrial and road building machinery and equipment. He is a director of the Fort Pitt Bridge Works, and has long been active in many civic, business and social affairs in his community.

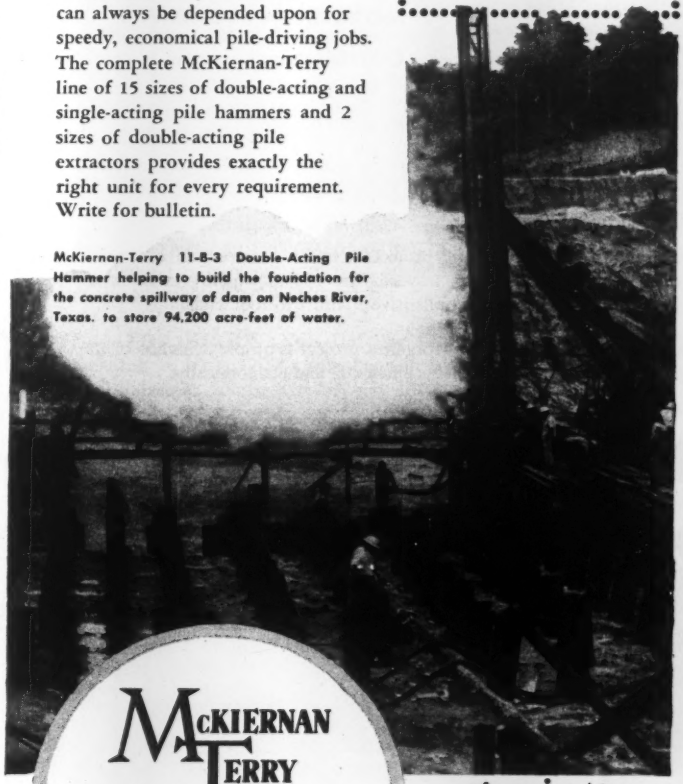
HARD PACKED CLAY

couldn't stop this

McKIERNAN-TERRY PILE HAMMER

To prepare the foundation for the concrete spillway of a new Texas dam, many, many piles were needed . . . 2,127 of them. In addition, the piles had to be driven into resistant, hard-packed clay. It might have been a tough and lengthy job, but not to the powerful, fast-driving McKiernan-Terry 11-B-3 Double-Acting Pile Hammer wisely selected by the contractors, Reynolds & Williams and Noonan Construction Co. • Contractors all over the world have learned from experiences like this that McKiernan-Terry Hammers can always be depended upon for speedy, economical pile-driving jobs. The complete McKiernan-Terry line of 15 sizes of double-acting and single-acting pile hammers and 2 sizes of double-acting pile extractors provides exactly the right unit for every requirement. Write for bulletin.

McKiernan-Terry 11-B-3 Double-Acting Pile Hammer helping to build the foundation for the concrete spillway of dam on Neches River, Texas, to store 94,200 acre-feet of water.



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GRAB BUCKETS

MK-282

RAYMOND versus OLD MAN RIVER

Major link in the flood-control system on lower Mississippi River is the 4,200-foot Morganza Floodway Control Structure, 42 miles northwest of Baton Rouge, La. Its 125 bays will have diversion capacity of 600,000 sec.-ft. into spillway at flood stages.

DRIVING 3,700 RAYMOND PRECAST PILES FOR MORGANZA FLOODWAY CONTROL . . .

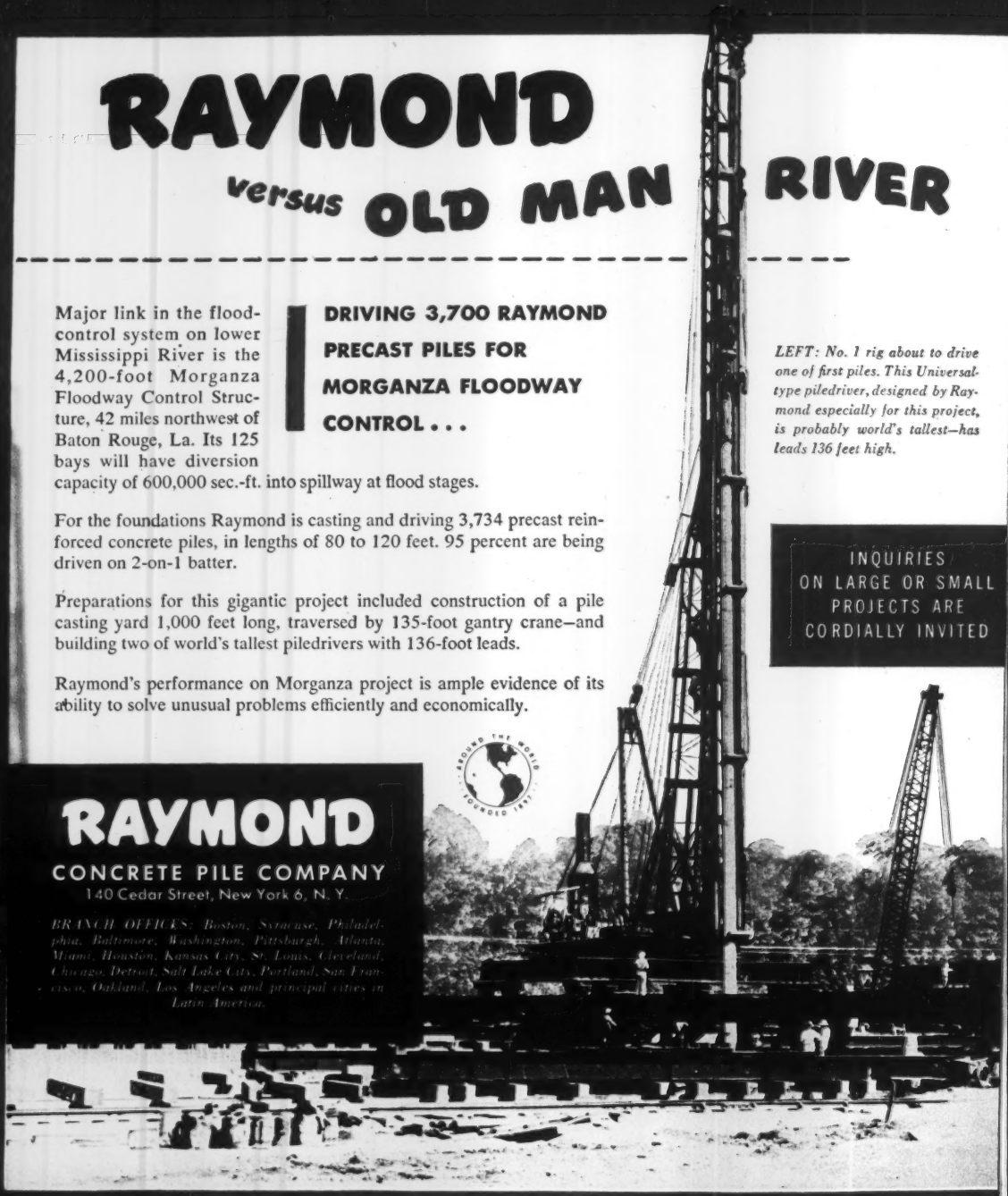
For the foundations Raymond is casting and driving 3,734 precast reinforced concrete piles, in lengths of 80 to 120 feet. 95 percent are being driven on 2-on-1 batter.

Preparations for this gigantic project included construction of a pile casting yard 1,000 feet long, traversed by 135-foot gantry crane—and building two of world's tallest piledrivers with 136-foot leads.

Raymond's performance on Morganza project is ample evidence of its ability to solve unusual problems efficiently and economically.

LEFT: No. 1 rig about to drive one of first piles. This Universal-type piledriver, designed by Raymond especially for this project, is probably world's tallest—has leads 136 feet high.

INQUIRIES ON LARGE OR SMALL PROJECTS ARE CORDIALLY INVITED



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THE CONSTRUCTION WEEK

NEW RULE—Secretary of the Interior Oscar L. Chapman, in pressing for expansion of electric energy-consuming industry (notably aluminum for the power-short Northwest), bases his assumptions in determining power resources upon median or possible water supplies. Engineering practice has been to estimate firm power supplies on the lowest water year of record, or at least a poor one. Chapman claims that the region has had median or better water in 20 out of the past 26 years.

PROCUREMENT MONEY—Comptroller McNeil's office in the Defense Department says there will be no shortage of procurement cash while Congress acts on another appropriation bill, not yet submitted. But the Corps of Engineers wonders what it is going to do after March 31, when its present money allotment for military supplies and procurement will be almost completely obligated.

DISPERSAL STYMIED—Plans to disperse federal agencies 20 miles outside the District of Columbia get another chance this week. The House Public Works group is weighing its subcommittee's 7 to 6 rejection of the proposal. On the other side of the Capitol, the Senate Public Works Committee hopes to reach agreement on a dispersal bill of its own.

MONEY FOR SHELTERS—There will be no federal funds for constructing family or community shelters—at least for the present. Instead, the federal Civil Defense Administration will encourage strengthening of existing buildings, perhaps to the extent of putting money into the job. But the RFC may lend money on approved applications such as Boston's, for a parking garage under Boston Common.

LITTLE STEEL FOR HIGHWAYS—Defense Mobilizer Charles Wilson reiterated a warning to New York's governor in his message to Governor Roy Turner of Oklahoma: There will be very little steel for highway construction in 1951-52—except for access roads to defense installations.

STEEL MILL BRINGS PROBLEMS—Considerable opposition is developing over the erection of the $250 million steel mill in the New London-Waterford, Conn., area (ENR Jan. 18, p.24). Residents say the mill would be detrimental to six towns and would make the region a prime target in the event of a bombing attack. A manufacturer of velvet cloth claims that he may be forced to move—on account of smoke that would be damaging to his product while in process.

SCHOOLROOMS LOST—The San Diego, Calif., schools system "lost" 197 classrooms to inflation since voters approved a $11,806,000 bond issue last November, according to Dr. Ralph C. Dailard, associate superintendent of schools in charge of building. Bids from contractors are said to be running from 15 to 37% higher than earlier estimates. The bonds were intended for a four-year program, but will be used far ahead of that time.

RED LIGHT FOR JURISDICTIONAL STRIKES—Elimination of jurisdictional strikes among unions of the building trades in Boston is sought by the unions themselves, according to Ernest A. Johnson, secretary-treasurer of the Building and Construction Trades Council. The council recently adopted two resolutions calling for the inclusion in specifications—and in each collective bargaining agreement—of provisions designed to prevent such strikes. (We wonder how contract documents can commit unions on jurisdictional matters.)

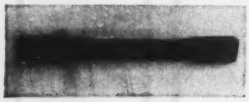
INLAND DATA for STEEL USERS

INLAND STEEL CO.

38 S. Dearborn Street, Chicago 3, Illinois

Typical mill tests for quality control of your steels

An important aspect of steel manufacturing is that, in the great majority of cases, steel is "tailor-made" to meet a specification or to make a particular part. It is therefore necessary for the steelmaker to know as much about each heat of steel as can be efficiently obtained. The tests described below are the main tests run by the steel producer to check the quality of the steel against the specified requirements. Naturally these tests do not stand alone as the final quality determinants. The steelmaker uses many other tests and his metallurgical experience as well as his knowledge of the steel fabricating processes to assure the customer of the right steel for the job.



1

2

BEND TEST

Bend tests are employed to determine the ability of steel to withstand cracking during subsequent forming operations at the customer's plant. Basically, the test consists of bending test pieces through certain specified arcs. (photos 1 and 2). The amount of bending a piece of steel will withstand depends on its chemical composition, its tensile strength, its thickness, and its grain structure.

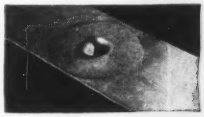
3

HARDNESS TEST

Abrasion, indentation, wear, cutting and shearing . . . all these are related to the hardness factor of the steel. Hardness tests are most often made after the steel has been heat-treated or just before it is to be temper rolled. Hardness is measured by Rockwell or Brinell testing machines (photo 3) which indent the surface of the specimen with a predetermined load. The relationship of the load and depth of indentation is then translated into a hardness reading.

CUPPING TEST

Clues to a steel's suitability for future drawing operations are uncovered by the cupping test. In this test, a sample piece of steel is placed in a special machine in which a smooth metal ball is forced against the flat surface of the specimen thus drawing it into the form of a cup and continuing the distortion until the material is fractured (photos 4 and 5).



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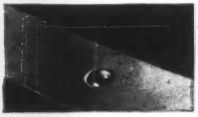
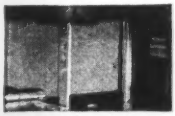


5

TENSION TEST

In applications where the steel will be under stress, either static or dynamic, the steel mill quality control department is interested in determining certain mechanical properties of the steel . . . tensile strength, yield point and the amount of elongation in a specimen of a certain length. Specimens of the various products are pulled asunder until fractured by hydraulic or mechanical testing machines which accurately measure the applied load (photos 6 and 7).



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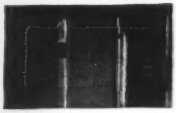

7

CHEMICAL DETERMINATION

The most widely used tests for quality control of steel at the mill, are the tests which determine chemical compositions of the raw materials and the finished products. It is estimated that Inland runs 1,250,000 chemical determinations each year. In addition to the wet chemical tests, the spectrographic method (photo 8) is widely employed for making quick, accurate determinations.

8

CONSTRUCTION TRENDS

HOUSING SHORTAGE EASED BY RECORD BUILDING RATE

The U. S. has taken huge strides toward relieving the postwar housing shortage. Heavy recent building has vastly improved housing conditions and the supply of housing units.

Preliminary results of the 1950 Housing Census show a big growth in the number of U. S. dwelling units—23% in ten years. The ten-year increase of 8,550,000 was the largest on record—and the survey does not include the million or so units probably completed since April 1 last year, when the Census was taken.

The Census also shows that the U. S. still needs a lot more housing—and new demand for housing close to defense plants will make needs temporarily greater. But it's still clear that the last ten years saw a remarkable improvement in the U. S. housing supply.

RISING VACANCY RATES—Present vacancy rates are evidence that the housing shortage is easing, although it's still with us. About 6.8% of all non-farm units available were unoccupied at Census time.

Effective vacancies are much rarer. The gross vacancy rate of 6.8% includes summer cottages, buildings not actually offered for rent or sale and dilapidated buildings. If those are all left out, the remainder of unoccupied units is only 1.7% of all non-farm dwelling units. Even that figure may exaggerate the effective supply; one-fifth of the available not-dilapidated buildings lack private toilets or baths.

Actually, the effective vacancy rate is probably understated. Since the Census was taken, completion of new buildings has eased the shortage in many areas.

Rent control also tends to create an appearance of scarcity, by encouraging people to keep houses and apartments they could not otherwise afford—when Los Angeles decontrolled rents, vacancies increased markedly.

Even though understated, the vacancy rate is much improved over the early post-war years. In 1947 the Census Bureau estimated the rate at only eight-tenths of one percent.

But the current rate is still below the estimated 1940 rate. The relatively low vacancy rate may mean that the U. S. doesn't have an adequate reserve of housing in many areas.

LESS OVERCROWDING—Homes are less crowded than in 1940. Then 7.1% of all units were classed as overcrowded—with more than 1.5 persons per room—compared to 5.5% in 1950.

Most serious conditions of crowding are in housing for the non-white part of the population.

This is nothing new—non-whites have never had adequate housing, on the average, compared to the white population. But for non-whites who rent their homes crowding actually got worse during the decade; 23% of non-white homes were classed as overcrowded in 1950, compared to 20% in 1940.

Greater crowding for non-whites is reflected in greater increases in the rent they pay. The median (average) rent paid by non-whites in 1950 was two and one-half times the 1940 average, while all renters combined paid about 70% more.

Crowding of non-whites shows one big source for future construction.

Wartime and postwar opportunities for jobs has made non-whites able to pay more for housing—as the figures on rent show. Now mobilization will lead to another improvement in the job market for non-whites. In the long run, greater incomes and the pressure of increasing numbers are bound to make the non-white population an important factor in the housing market—especially for large urban housing projects.

MORE SMALL HOUSEHOLDS—Size of the average American household is getting steadily smaller. It was 3.0 persons in 1950 compared to 3.2 (1940).

Post-war marriages caused huge growth in the number of two-person households—45% in ten years. At the same time, large numbers of people left home to live alone—and the number of one-person households shot up 55%.

Rapid formation of small families caused a terrific trend in housing construction—toward building medium-sized units. Although the number of large units increased only slightly, and one-room units actually decreased in number, the number of four-room units went up 58% and three-room units were up 42%.

This trend points to a possible future shortage of larger housing units.

As new postwar families get larger, and children grow older, millions of families will start looking for larger homes. When that happens there may be a real shortage of housing—even though the number of medium-sized units might be more than adequate.

THE OUTLOOK—If home-building had continued at 1950 levels, all traces of the housing shortage might have been wiped out within a few years. Even now, most of the shortage has disappeared.

Mobilization will create new shortages of housing in some areas. But this will be only temporary: In the long run, the big housing market seems to lie in the need of growing families for larger units, and in the improvement of facilities for people who still live in sub-par or overcrowded houses.

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Wholly inadequate highways

HIGHWAY AUTHORITIES are showing growing concern over what is happening with respect to highways under the defense program. Secretary of the Treasury Snyder has proposed stiff increases in automotive excise taxes and a doubling of the federal tax on gasoline, and many state legislatures are proposing to increase their automotive and fuel taxes. Yet much of the increased revenue is destined to go into general funds, not into meeting the ever-increasing need for more highway construction.

And the Office of Defense Mobilization does not appear to be unduly concerned over the prospect for more rapid deterioration of existing highways under the greater load that the defense program will put on them, despite Director Wilson's statement to Governor Dewey of New York that every effort will be made to provide materials needed for urgent replacements and for highway maintenance. Steel for new highways, Mr. Wilson said, would continue to be very tight for about 18 months after June 1 of this year.

Mr. Wilson told Governor Dewey that steel could not be provided for New York's cross-state "Thruway" because it could not be completed within two or three years—which seemed reasonable if that approach was to be taken toward all long-range projects that if started now would nibble into the limited steel supply for the months immediately ahead.

A similar response was made to Governor Murray when he inquired as to the prospects for steel for highway work in Oklahoma. However, within a few days after Director Wilson had said that steel cannot be provided for projects requiring two or three years for completion, he approved an early start on the St. Lawrence seaway and power project, which cannot be completed under four or five years. Mr. Wilson said that the St. Lawrence project is essential to building our defense capacity to "a level of overwhelming strength for the 10 or 20 years of international tension that may lie ahead."

Possibly the St. Lawrence ship canal is essential to that long-range program, yet it cannot be anywhere near as important as an adequate primary highway system. If only enough steel is to be supplied to our highway departments to maintain the existing highway system through the months of critical shortages that lie immediately ahead in order to have steel to start work on any and all long-range power, irrigation, navigation or flood control projects that are dear to the heart of people high in government circles in Washington, then it is time for highway authorities to convert their concern into action.

If highway building during the next two years is to be made secondary to a variety of projects requiring three, four or five years for their construction, then it appears necessary for the state highway departments and the Public Roads Administration to concentrate on demonstrating to the Truman Administration and mobilization Director Wilson that this nation's highway system will be hopelessly inadequate for the needs of the defense program by the end of those two years, to say nothing of the long-range program of ten to twenty years.

Better steel for structural work

STEEL that meets requirements of the widely used Specification A7 of the American Society for Testing Materials may possess qualities that make it unsatisfactory for some structural purposes. This was brought to light by comments on the spectacular bridge failure at Three Rivers, Quebec. It appears probable that the steel in that bridge did not fully meet A7 requirements, but in discussing the disaster, some authorities called attention to deficiencies in A7, which presents requirements for the chemical composition and mechanical properties of structural steel for bridges and buildings that steel makers have to meet. These engineers point to a need for revision of A7 or for a new, more exacting specification covering steel for types of work for which A7 is not strictly applicable.

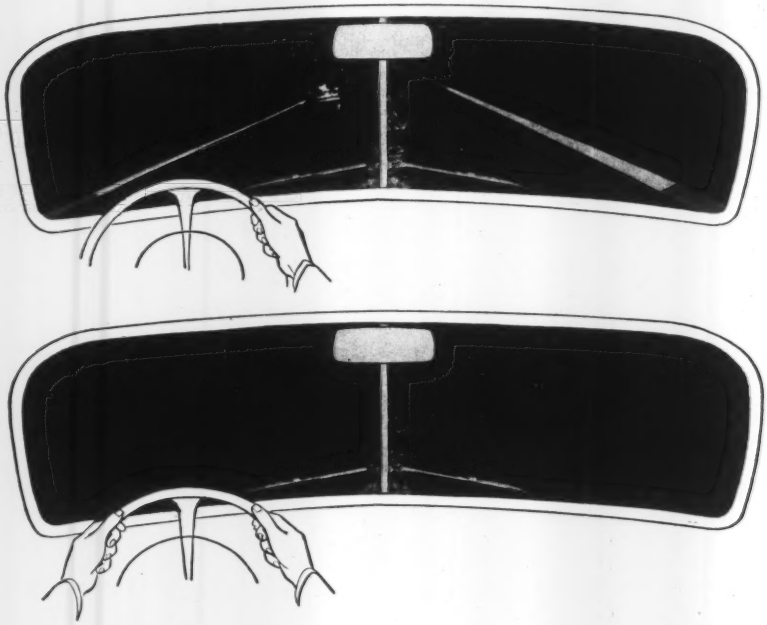
One deficiency of the present A7 specification is lack of close control of carbon content. For example, the carbon content may be too high for steel that is to be welded. That is particularly true when the plates to be welded are thick.

Steel made to A7 requirements may also be excessively notch sensitive at low temperatures. This characteristic may be of serious concern when the steel is to be exposed to severe winter conditions.

An explanation of why these deficiencies in Specification A7 have not been recognized and corrected may be found in the fact that experienced structural engineers, in recent years, have been reluctant to serve on the ASTM subcommittee responsible for keeping the specification up to date. As a result, that group now is made up chiefly of representatives of the steel makers, who cannot be expected to inaugurate changes that might be troublesome to their employers. Hence the need for such organizations as the American Society of Civil Engineers, American Railway Engineering Association, American Association of State Highway Officials and the American Welding Society, as well as government agencies concerned, to urge experienced structural engineers to work on the ASTM subcommittee. Only by getting such experts to participate in the work of keeping A7 up to date can there be any hope of developing modifications of the specification that will minimize its present weaknesses.

Which curb would you specify

. . . for safer driving on wet nights?



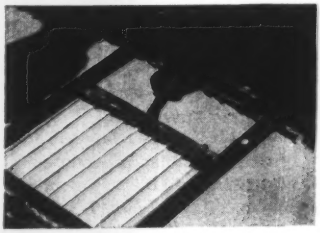
RAINY NIGHTS can be made safer-driving nights when Atlas White Reflecting Curb, top picture, keeps the road's edges bright and visible. But smooth curbs shown below are another story. They're indistinct when wet. Drivers are less certain of their way ahead.

At night, highways equipped with Reflecting Curb are safer, far more pleasant to drive on. These safety curbs clearly outline the road ahead because their saw-tooth faces catch and reflect headlight rays back to the driver. When it's raining, Reflecting Curb is at its best. Water makes the faces mirror-like.

On some of our finest highways, like New York's new Taconic State Parkway, Reflecting Curbs are making night driving safer. More and more engineers put "Atlas White Reflecting Curb" in their specifications.

Placement is simple and fast. One method is to pour an Atlas White Duraplastic cement-sand mix on a grey concrete base, screed to 1-inch thickness and score with a hand tool (pictured right). Contractors prefer Duraplastic* because its air-entrainment feature makes the mix more workable, more plastic; makes placement and scoring easy.

For more information write: Atlas White Bureau, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.



*"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

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"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network*

ENGINEERING NEWS-RECORD

MARCH 15, 1951 VOL. 146 NO. 11

States set $2 billion goal for construction 1951-1953

Construction takes one third of budget totals in 22 states as administrations ask $1.4-billion for roads, $361-million for public buildings.

David E. Reilly
Assistant Editor

From coast to coast in some 44 states of the union, legislators are meeting early this spring to determine the dry financial facts that ultimately result in big contracts for the construction industry.

Early returns from our ENGINEERING NEWS-RECORD survey of budget proposals, (22 states) it looks like one-half the national total for the construction industry is $2,179,400,000.

Most of this is a two-year figure, as a glance at our table of returns will show. That means that for the year ahead there will be around one billion dollars spent on roads, hospitals, and schools. Yes, even on jails!

• **Warm weather and highways**—Highway construction work will, of course, lead all comers since most school work is carried on at a municipal level. In this area our survey for the 22 states covered in this report shows a total of $1,441.4 million for road work. Here again we warn that this represents a two-year period in most cases.

Schools show a total of $267.8 million for the states covered, and hospital construction some $103.4 million. Other types of public building—and in some cases the figures we have will include hospital and small school building appropriations—total $360.6 million.

A quick glance at state figures will indicate where the money is for construction work, where design is needed, etc. These figures will represent direct state appropriations and not reflect federal funds except where so stated.

Construction represents more than one third of the total budgets of the 22 states surveyed here. Highway and road work represents more than one half of this construction sum.

In New York (ENR, Feb. 15, p. 26) some $278 millions were earmarked by Gov. Thomas E. Dewey for construction in the year immediately ahead. This sum includes some balances from last year. It also includes $160 million for highways, of which $60 million is proposed for the Thruway.

• **Big figure California**—In California the newly-proposed budget amounted to something over a billion dollars, of which $139.7 million was for construction. Some $92.8 million was suggested for highway building, and 46.2 million for other types of construction.

Big item in California: $220 million for schools over the next three years, money to come from bond issues. This will not be a budget item.

And speaking of California, we naturally think of Florida's budget which holds a sizable $203.6 million for construction over the next two years. Of this $141.6 million will go into highway construction. This is $36.9 million more than anticipated highway user revenue, and is the biggest ever submitted by the State Road Board. Largest item: $67.1 million for primary roads. Next largest: $25.7 million for two bridges and other portions of the Duval County expressway. Nearly $40 million of this budget represents carryover from 1950.

• **Two years and half a billion**—In Missouri Governor Smith submitted a $609.9 million, two-year budget that held $248 million for the construction industry—$154.4 million of it for roads and highways, $13 million for hospitals, $4 million for other types.

In reporting on highway costs, Gov. Smith pointed out that of the $154 million highway budget, road maintenance alone would cost $12 million—two and one half times what it cost prior to World War II. At the same time, urban area needs demand attention, he said, referring to the $100 million St. Louis needs to build its three expressways.

Over the next ten years Missouri will need to spend $25.6 million on its highways, the governor said.

Other proposals included $2.2 million for a 12-story wing to the new state office building under construction; $1.2 million for Jesse Hall, University of Missouri; and $1.75 million for a 5-story addition to the new state office building.

• **Details on Minnesota**—In Minnesota Governor Youngdahl's message detailed new construction other than highway work as follows:

Institution for the mentally deficient (a move to get rid of "snake-pits") $6.5 million; Anoka state hospital, $245,000; Fergus Falls state hospital, $105,000; Hastings state hospital, $495,000; Moose Lake state hospital, 116,000; Rochester state hospital, $1,300,000; St. Peter state hospital, $103,500; Willmar state hos-

(Continued on page 24)

Labor, steel, equipment shortage looms

A labor and structural steel shortage, a shortage of electrical and construction equipment is in the making for the summer ahead—is almost here—with corners sticking out for all to see. For builders, there are headaches ahead—some already singingly here.

ENGINEERING NEWS-RECORD has put key questions to leaders in labor unions, to steel and electrical supply houses and construction equipment suppliers in 16 cities of the U. S.

Our key questions covering the construction front: How is labor supply holding up in the face of reported impending manpower shortages? What is happening to deliveries of structural steel (new orders)? How soon can delivery be had on electrical and heavy construction equipment?

For contractors, architects and engineers who have not learned the answers the hard way, here are the answers:

• **Labor, long and short**—If labor is short, it is still long enough this early spring to have some "normal unemployment."

Boston reports about 5% of the carpenters union seeking employment, and an equal number in the hod carriers' and common laborers' unions. This is "normal" these postwar years. Denver sends a similar report.

St. Louis reports all its carpenters gainfully employed, although some are currently working on other types of jobs (about 1,500 out of 7,500). Unions there expect more men will be needed than will be available once the building season gets rolling—and all on regular carpentering jobs. About one

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States plan big construction programs

(Continued from page 23)

pital, $478,000; Faribault state school and colony, $469,000; Cambridge school and hospital, $258,000; Owatonna school, $250,000; Red Wing training school, $850,000; Bemidji Teachers College, $415,000; University of Minnesota, $3,000,000; State Capitol power plant, $2,000,000; sewage disposal plants (several) $1,139,000.

Overall requests of the Governor included $175.8 million for construction, of which $156 million was for road and highway construction.

• **And Michigan**—Michigan's Gov. Mennen Williams has called for an overall construction budget of $49.3 million for the year ahead, of which some $37 million was given over to highways in the proposed budget, $2.7 million to hospitals, $7.8 million to schools, and $1.8 million to other buildings. Around $58 million for Civil Defense appropriations for the period ahead properly belongs under this last classification but was not included in the total budget figures of the governor, nor was highway construction.

Of the other than highway building, $2,828,000 is proposed for college buildings; $1,250,000 for a library at Michigan State College in Lansing; $480,000 for a vocational educational building for the blind, Lansing; and $103,000 for a storage building at Michigan College of Mining and Technology, Houghton.

• **Pine and palm**—Massachusetts also has moved ahead into a fiscal year that Governor Paul A. Dever has planned to have cost $271 million. Of this $24.2 million is scheduled for the state's new expanded highway program (ENR, Jan 11 p 29), and $35 million for various public buildings. Total construction budget for the state: $59.2 million.

Georgia's Governor Herman Talmadge also presented a heavy budget for the two years ahead of that state by asking for $200 million, of which $116.5 million was apportioned for construction work. The highway budget for the year ahead promises to total nearly $50,000,000 what with a carryover of $20,000,000 in funds open for contract (and federal aid). Direct state appropriations for the two years ahead should be $42,980,000.

State aid to school construction is reflected in a $93 million school budget. Meanwhile, 29 more hospitals and health centers are in the planning stage, Talmadge says, following last year's construction of 37 hospitals, eight additions to hospitals, two nurses homes, one state tubercular laboratory, two equipment projects, and 37 public health centers. These were all completed, under way or started in 1950.

Money is also proposed—$1,791,639,—for wharves, piers and aprons at the state port, Savannah.

• **Summary:** In this first section of the Engineering News-Record survey of the 44 states having legislative sessions this year we find total budget figures adding up to $6,535,070,000, of which $2,179,400,000 is proposed for new construction in the 22 states reported on here.

Construction figures break down by categories: $1,441,380,000 for roads and highways; $267,800,000 for school building; $103,400,000 for hospital and other medical construction; and $360,600,000 for miscellaneous types of public construction such as office buildings, penal institutions and port structures.

Twenty two states, exactly half of the states with legislatures meeting, are covered in this survey. Figures are not actual appropriations, but represent departmental or administration requests.

STATE BUDGET PROPOSALS

(In millions)

Here are budget requests affecting the construction industry from 22 of the 44 states whose legislatures are meeting this year. Bracketed figures represent money borrowed, not appropriated, by bond issues. Figures marked with an asterisk include balances from previous appropriations. These figures represent requests, not solid state commitments. They represent money asked for by the administrations and the various departments of the states listed.

State	Budget Period	Total Budget	Constr. Budget	Roads & Highways	Hospitals	Schools & Colleges	Other Building
Arkansas	1951–1953	.....	78.0	20.0	24.0	31.0	3.0
California	1951–1952	1,016.8	139.7	92.8	.....	(220.0)	46.2
Florida	1951–1953	252.5	203.6	141.6	.....	.....	62.0
Georgia	1951–1953	200.4	116.5	42.98	.....	93.0	1.0
Idaho	1951–1952	93.2	21.4	20.7	.....	.....	(2.3)
Indiana	1951–1953	531.8	173.7	151.0	9.5	8.7	1.9
Kansas	1952–1953	85.3	55.6	38.7	2.2	12.6	2.1
Maryland	1951–1952	159.0	89.5	63.0	23.5	3.0	.....
Massachusetts	1951–1952	271.4	59.2	24.2	.....	.....	3.5
Michigan	1951–1952	294.0	49.3	37.0	2.7	7.8	{58.0 1.8
Minnesota	1951–1953	736.9	175.8	156.0	.....	.....	19.8
Missouri	1951–1953	609.9	247.3	154.4	13.0	75.9	4.0
Montana	1951–1952	63.9	44.0	9.0	.....	19.9	15.1
New Jersey	1951–1952	180.6	46.7	27.5	.....	.....	19.2
New York	1951–1952	983.9	278.0	160.0	26.0	.....	*67.4
Oregon	1951–1953	180.4	71.7	47.8	.1	11.6	12.2
Tennessee	1951–1953	231.5	76.5	70.0	.....	.....	6.5
Utah	1951–1952	.....	17.5	12.0	.....	.....	(5.5)
Wyoming	1951–1953	.....	23.3	22.8	.....	.....	(.5)
Nebraska	1951–1953	158.9	38.7	26.5	2.5	4.3	5.4
North Carolina	1951–1953	459.5	126.1	76.1	.....	(50.9)	.....
South Carolina	1951–1952	130	47.3	47.3	.....	.....	.....

Labor backlog low, ENR survey shows; structural steel deliveries "critical"

(Continued from page 23)

sixth of the hod carriers and common laborers of the area are unemployed in their regular vocations. But open season for labor is coming up. Here again the supply appears short in measure against ultimate demand.

In New York City the labor supply is particularly tight, those seeking employment numbering only in the hundreds, and those for reason of turnover. This is typical also of Cincinnati, Cleveland, Minneapolis, Los Angeles, and Detroit.

• **Where it is less scarce**—Larger percentages of unemployment are reported in Chicago (carpenters 10% unemployed); Dallas (50% of the hod carriers and common laborers); Seattle (carpenters 20% unemployed, hod carriers and common laborers 40%); San Francisco (carpenters 30% on part time work, hod carriers and common laborers 5% in the "turnover stage"); Kansas City (hod carriers and common laborers reported 25% on other work); Birmingham (carpenters 20%, hod carriers and common laborers 25%); and Pittsburgh—20:20.

Generally speaking, labor leaders report "the best winter in a long time" for their men. This could mean "the worst summer in a long time" on the labor supply front for contractors.

• **Where steel cuts short**—Steel supply houses in the 16 cities were asked how soon regular customers could get delivery on 25 tons of ½ and ¾ inch steel reinforcing bars.

There seemed to be two sets of answers to this question: Some houses replied that they could deliver in 30 to 60 days, especially if there was a DO (Defense Order). Cities where this delivery is possible included Los Angeles, San Francisco, Denver, Cleveland, Pittsburgh and St. Louis.

Other cities (these included Birmingham, Seattle, Kansas City, New York and Chicago) reported deliveries available in 60 to 90 days.

Deliveries were more difficult in the remaining centers of commerce. Detroit, where labor is tight, is also tight on steel: Eight months, and in driblets over that period on reinforcing steel. The situation there would be serious except for imported steel.

Bright spot in the picture is Dallas. Deliveries there can be had on reinforcing bars (fabricated materials) in 10 days to three weeks.

• **The structural form**—Light structural steel shapes are becoming critical. Answering as to when 50 tons could be delivered, the most optimistic report of any frequency was 60 to 90 days. Steel supply houses generally would not take an order of that size, and would promise delivery only on smaller orders. New York, Chicago, San Francisco, Cincinnati and Kansas City were in this category.

In St. Louis an order of 50 tons would "not be considered". Smaller orders might get delivery in 30 to 60 days. In Dallas delivery of fabricated materials in this category might be had in eight to ten weeks. Pittsburgh has its doubts, but thinks in terms of 30 to 60 days. Mills at the mill capital are behind on deliveries.

The saddest songs come from Detroit, where delivery might take a year, and at the least 90 days (DO). Minneapolis won't quote except on DO orders.

Denver, and Cleveland supply houses report delivery.

• **The plentiful switch**—Although the steel shortage is beginning to show in structural material, it has not reached a critical point for purchases of electrical construction items. Since there is such a wide variety of electrical construction items, replies were in some variance. Generally the situation is not too rough in the 16 cities.

Asked about deliveries, the range most typical came from Chicago:

"Immediately" on switches and small wire; 36 weeks on specialty motors and conduit.

New York reported steel appliances in "good" supply, with deliveries made in a week or so. Fixtures also in good supply. Wiring, however takes 30 days, and copper, large sizes especially, cannot be had within 60 days even with a DO rating.

This situation is typical for most of the 16 cities surveyed including Cincinnati, Birmingham, Seattle, Detroit, Dallas, Kansas City, and St. Louis.

Copper seems the most critical item. San Francisco makes no promises on copper wire, and is short on all items. Los Angeles gives deliveries in 60 days on all standard items if a DO is involved. Non-DO orders get no promises. In Cleveland it takes 15 to 30 days with DO's, 30 to 60 days without, specialized equipment longer.

Pittsburgh asked to be excused.

• **The crawler that weighs 10-tons**—Construction equipment dealers, when asked how soon they could deliver a 10-ton crawler or truck crane generally replied evasively. Seven months to a year seemed to be the opinion of most called. That would include New York, Denver, Seattle, Kansas City, Chicago, Cincinnati, Minneapolis.

These replies fitted only situations without DO orders. This, of course, under current circumstances means most purchasers inside the limits of continental United States.

Equipment dealers were almost unanimous in believing contractors could weather a short-term new equipment scarcity. Typical of some of the replies was the following from a New York dealer:

"Yes, I think the industry can hold out through a reasonable period if not overworked by the Army and Navy. . . . After all, it is always possible to rent equipment in the pinches. . . . However I do think the present use of DO's for the purchase of overseas equipment has got to give place to a priority system right here inside the United States."

Another dealer also agreed that the industry could weather a shortage, but added that for tractors, most critical of all equipment items, tracks, rollers and idlers are becoming critically scarce.

Less optimistic was the report from Cleveland, where some opinion is that contractors are not well enough equipped for an equipment scarcity. Army bites into production in the area have caused this pessimism, along with the amount of desperation buying going on.

These are the answers from labor and supply men, coast to coast, to ENGINEERING NEWS-RECORD's question box. Sixteen cities surveyed were: Birmingham, Boston, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Kansas City, Los Angeles, Minneapolis, New York City, Pittsburgh, San Francisco, Seattle, and St. Louis.

New limit on equipment

In a move designed to assure equitable distribution of defense-rated orders among manufacturers of construction machinery and equipment, National Production Authority last week limited individual producers' requirements for accepting DO's monthly to 50% of the average monthly shipments during the six-month period ending June 30, 1950.

NPA says the action should result in making available construction machinery and equipment for such essential defense-supporting industries as mining and the handling of strategic materials, logging, and defense construction.

The order, M-43, also permits a 45-day lead time for delivery on rated orders. NPA will provide assistance, however, in placing rated orders where producers have declined to accept them under the 50% ceiling provisions.

THREE-HOLER—How New Jersey end of Lincoln Tunnel will appear after addition of a third tube south of present tubes. Plaza and ramp widening are required.

Port of New York Authority discloses plans for third Lincoln Tunnel tube

By 1957 added Hudson crossing would carry 8.5 million cars per year—Cost expected to equal that of two existing tubes: $85 million

Plans for a third Lincoln Tunnel tube under the Hudson River were announced last week by the Port of New York Authority. The proposed new tube, comparable to the existing two in dimensions, would be ready by 1957—about 150 ft south of the present south crossing. Estimated cost—$85,000,000—is just about what the present twin crossing, begun in 1934, cost. (ENR Jan. 18, p. 29).

The new two-lane tube, operated eastbound, would increase the crossing's capacity by 8,500,000 trips per year and would double its peak-hour capacity. The present south tube (to become the center tube) would carry eastbound traffic in morning rush hours and westbound in evenings, making four lanes instead of two available for the heavy flow. Between peak-hours the center tube would carry two-way traffic.

Announcement of the plan by the Port Authority was to be followed by a conference of the state and municipal engineers involved. Approval must come from the municipalities affected.

Authority officials stated last week that they had been given no assurances on availability of materials. The 7,944-ft new tube would require 50,000 tons of cast-iron tunnel lining; 1,000 tons of structural steel; 5,000 tons of reinforcing steel; 5,000 tons of cast-iron castings and pipe; 1,900 tons of cast-steel tunnel lining; 1,800 tons of steel bolts.

• **At today's prices,** $67,606,000 of the total estimated cost would go for construction. Some $9,000,000 would be spent on real estate in Manhattan where 800 families would need relocating to make room for new approach routes extending south to 30th Street.

On the New Jersey side, $2,000,000 worth of real estate would be bought up in order to add five toll gates (72 ft) to the present 182-ft wide plaza and widen the steep, curved approach ramp by one lane.

Farther west, the six-lane viaduct carrying tunnel and local traffic over U. S. 1 toward the New Jersey Turnpike would be widened to eight lanes. Port Authority at present has $3,500,000 worth of construction under way on approaches to the Turnpike which is being built just beyond U. S. 1.

In New York, the new tube would enter the present south plaza, and new depressed routes would be built to distribute traffic from it, as well as to and from the present south tube.

• **Estimated six-year completion** time takes into consideration existing materials problems. Interest during construction would cost near $6,000,000. Return upon completion is estimated at $400,000 per year (or 0.5% of the investment) based on present toll charges.

Nine months would be required for design, during which materials orders could be made. It is hoped that financing, too, might get started soon.

Materials supply becomes short ahead of 'schedule'

Further tightening is in prospect for construction materials during the second quarter. Some of the best informed observers expect nearly all building materials to run short this spring and summer. All agree that the steel shortage will be acute.

Along with increasing military construction, civilian building apparently is consuming steel in excess of year-end estimates. At that time, non-defense construction was expected to use about 10% more steel in the first six months of 1951 than a year ago.

Steel set-asides for DO orders now take 35% of structural shapes and plate and 20% of reinforcing bars and rods.

Pressure for DO orders to help industrial construction for defense aims primarily at steel. The NPA Iron and Steel Division hopes to allocate steel to industrial defense projects under the CMP system that takes effect July 1.

Reduced construction volume in some classes of building—residential, amusement and commercial—had been counted on to relieve the demand for such materials as lumber, plywood, gypsum products and portland cement.

Authorization of DO orders for maintenance, repair and operation needs has not helped the situation. Construction men are critical of NPA's system of placing dollars of building materials and products subject to priorities on an equal footing with DO orders of the Defense Department and the Atomic Energy Commission.

Gen. Farrell to direct DPA resources expansion

Appointment of Maj. Gen. Thomas F. Farrell as deputy administrator for resources expansion in the Defense Production Administration was announced last week by Administrator William H. Harrison.

A civil engineer who began his career on the New York State Barge Canal and who served as chief engineer of the state's Department of Public Works from 1930 until recalled to military service in 1941, Gen. Farrell became chief engineer of the China-Burma-India Theater of operations, 1943-1945.

He was deputy to Maj. Gen. Leslie R. Groves in the Manhattan District atom bomb project, and chief of the Construction Division of the Office of the Chief of Engineers. Farrell was chairman of the New York City Housing Authority when recalled to active service last year.

CONSTRUCTION BUSINESS

Basic industries in building boom

The record-breaking $1 billion in new industrial plant put under contract in January and February comes mainly from four basic industries—metal refining and rolling, public utilities, process or chemical industries and metal working plants.

Expansion in metal refining and rolling accounts for $462 million of the total. Public utilities, in the first two months of this year, have started new work valued at $225.7 million. Process industries have signed contracts to go ahead with construction worth $165 million. Automobile factories have signed up for $41 million to expand plant to handle defense orders, and machine and machine parts producers have started construction on new plant valued at $62 million.

The complete score for this unprecedented industrial building activity is shown in the table below:

Industrial Building Contracts Type of industry	Jan.-Feb. 1951 No.	Value
Transportation Service		
Railroad	4	$827,000
Automotive	52	11,584,000
Public Utilities	24	225,685,000
Process Industries[1]	115	165,089,000
Food Industries[2]	56	16,292,000
Metal Ref. & Rolg.	14	462,168,000
Metal Working Plants		
Auto Factories	5	41,200,000
Aircraft Factories	1	82,000
Foundries	5	836,000
Mach. & Mach. Parts	91	62,270,000
Radio, TV & Electronics	5	1,610,000
Textiles (excl rayon)	15	6,224,000
Wood Industries	16	2,649,000
Miscellaneous		
Gen. Factories	145	29,124,000
Refrig., etc.	5	721,000
Total	553	$1,026,361,000

[1] Includes distillers [2] Includes breweries, frozen food plants and lockers.

Cost of construction money

Yields on state and municipal bonds dropped to 1.62% in January, 1951, from 2.08% a year ago and 2.09% in July, just before the higher income tax went into effect. The new rate is the lowest on record since April to July, 1946 when yields were down to 1.45% to 1.60% and starting up. The rate has dropped steadily since August.

Yields on other high grade bonds had been rising slowly during 1950 to 2.54% for industrials, to 2.65% for public utility bonds and to 2.71% for railroad bonds in December. In January industrials dropped back slightly to 2.53% compared to 2.42% a year ago; public utility bond yields in January dropped back to 2.64% against 2.59% the year before; and railroads dropped back to 2.69% compared with 2.62% in Jan., 1950.

Building costs rise faster

• **The Smith, Hinchman & Grylls** building cost index rose 4 points to 253 in February. This compares with 249 in January, 247 in December and an average of 230 for 1950, all values based on 1926 = 100.

All along the line material prices and wage rates are up, also overhead and taxes. Performance continues to lag and firm bids are harder and harder to get from contractors, Smith, Hinchman & Grylls, Inc., architects and engineers of Detroit and New York, report.

• **Boeckh:** Cost of building commercial structures and factories increased 3.7 points to 231.1 in January, according to the national average for twenty major pricing centers as reported by E. H. Boeckh & Associates. This compares with 227.4 for December 1950, and with 218.6 the average for 1950. Brick and concrete commercial and factory buildings costs went up to 230 from 226.3 in December and the 218.8 average for 1950. All are based on 1926-29 = 100.

Brick and concrete commercial and factory building costs in the New York City area for January were up to 262.2 from a naverage of 251.5 for 1950.

Cement output and stocks

Production of Portland cement in January was 15% more than output a year ago. At 17.33 million bbl it topped January shipments by 42%.

Shipments in January totalled 12.237 million bbl, a 27% increase over January a year ago, the U. S. Bu. of Mines reports.

Stocks of finished cement were up from their low state of last fall to 18.215 million bbl. But this reserve supply is 10% less than a year ago.

Airports increase paving

Awards of 1,221,842 sq yds of pavement at airports this February is 1,410% more than the 81,310 sq yds awarded in Feb., 1950, The Portland Cement Assn. reports.

This brings total yardage for roads, streets, alleys and airports to 4,835,598 in February, a 107% increase over 1950. Roads, with awards of 2,399,664 sq yds are up 75%, streets and alleys, with 1,214,092 sq yds are up 39%.

Industrial building backlog grows, too

Along with the unparalleled rate of putting new industrial building under contract there has been a similarly rapid rise in the proposed construction backlog of building expansion planned, but not yet started.

The backlog totals $6,849,529,000 of proposed industrial buildings on record at the end of February, 1951. This represents an increase of $1,096,396,000 since the end of December, 1950.

Projects making up this backlog are located in these regions:

New England	$360,906,000
Middle Atlantic	1,061,228,000
South	799,332,000
Middle West	1,830,505,000
West of Mississippi	2,195,523,000
Far West	602,035,000
United States	$6,849,529,000
Canada	$1,152,502,000

Texas continues to hold its lead with a $1.3 billion backlog, Ohio is second with $644 million and Indiana is third with $449 million.

These figures do not include any of the government plans for federally owned atomic energy plants.

St. Louis drops plan to sell bonds, buy Govt's

St. Louis' Board of Estimate and Apportionment has withdrawn the proposal to sell $41.7 million in authorized but unissued municipal bonds and invest in Federal securities earning a higher rate of interest than the city bonds pay. Opposition to this financial speculation came from the Citizens Bond Issue Supervisory Comm. Back of the scheme was the fear that tax exemption would be removed from municipal bonds. Comptroller Carpenter reported "our information now is that there will be no change in the tax exemption".

Lumber output vs orders

New lumber orders were 5.2% below production for the week ending Feb. 24, but shipments were 7% above the National Lumber Manufacturers Assn. reports. Unfilled orders amount to 61% of gross stocks.

Compared with the same week last year, production this year is 5.1% higher, shipments are 1.5% lower and new orders are 15.1% lower.

For the year to date, however, shipments of lumber are 6.9% above production and new orders 14% above.

BIDS AND BIDDERS

(Major project news received after Construction Reports, page 68, went to press.)

Power House and Tunnel—G. F. Atkinson Co., San Francisco, Calif., was low bidder at $14,690,000 for constructing power house, tunnel and appurtenances at Ross Dam, when the City of Seattle, Wash., opened bids Mar. 7. E. R. Hoffman, is city light superintendent.

Cement Plant—Duval Engineering & Contracting Co., Jacksonville, Fla., and Walsh Construction Co., New York, N. Y. will build a $11,000,000 cement manufacturing plant, near Bunnell, Fla., for the Lehigh Portland Cement Co., Allentown, Pa.

Housing—$20,000,000 worth of housing projects are being planned by the Bremerton Housing Authority, Bremerton, Wash.

Aluminum Plant—Al Johnson Construction Co., Minneapolis, Minn., has been awarded $11,250,000 contract to construct aluminum plant at Port Lavaca and Port Neches, Tex. for the Aluminum Company of America, Port Lavaca.

Mayo Memorial Center—University of Minnesota, Minneapolis, Minn., received low bids Feb. 21, for the Mayo Memorial Center from Gus K. Newburg & Co., Chicago, Ill., at $8,647,000. C. H. Johnston St. Paul, is architect.

Marine Barracks—Public Works Officer, Sixth Naval District, Naval Base, N. C., awarded contract to construct, manage and finance Marine Barracks at Camp LeJeune, N. C., to C. D. Spangler Construction Co., Charlotte, N. C. at $6,473,000. Edwards, Pugh & McKimmon, Valand & Martini, all of Raleigh, N. C. are architect-engineers.

Freight Yards—S. N. Nielson Co., Chicago, Ill. will build the Kirk Freight Yard at Gary, Ind., for Elgin, Joliet & Eastern Railroad Co., Gary. Work which will cost about $5,000,000 will include yard, office and labor buildings, freight handling facilities and electrification. Sverdrup & Parcel, St. Louis, Mo., are consulting engineers.

Power Improvements—Dayton Power & Light Co., Dayton, O., plans installing generators at Hutchins Station at Miamisburg, O. and extending power lines throughout Ohio. Estimated cost is about $30,000,000.

Housing—N. B. Perini & Sons, Inc., Framingham, Mass., will construct a $6,287,000 housing project at Hartford, Conn., for the City of Hartford Housing Authority. Kane & Fairchild, Hartford, are architects for the project.

National Defense Headquarters—Defense Construction Ltd., Dominion Government, Ottawa, Ont., is considering constructing $16,000,000 underground headquarters near Ottawa.

Residential Development — Family Homes, Inc., Detroit, Mich., will build $5,000,000 homes at Adrian, Mich., by own forces.

Waterworks and Sewage Program—City of Augusta, Ga., plans $6,000,000 waterworks project and $10,000,000 sewerage facilities to new area adjacent to defense plants. Robert & Co., Atlanta, Ga., are consulting engineers for water supply and Patchen & Zimmerman, Augusta, for sewerage facilities.

Batchelor Office Quarters—J. C. Boespflug Construction Co., and S. Birch & Sons, Seattle, Wash., offered $3,491,575 low bid to build batchelor officers quarters at Elmendorf Air Force Base, Alaska, when the U. S. Engineers, Anchorage, opened bids March 7.

Albani Falls Dam—Donovan-James Construction Co., Seattle, Wash., has been awarded $3,839,148 contract for second stage construction on Albani Falls Dam, in Priest River, Idaho, by U. S. Engineers, Seattle, Wash.

Grain Handling Facilities—A. E. Staley Manufacturing Co., Decatur, Ill., plans expanding grain handling facilities at Decatur, to cost about $3,000,000.

Water System—City of Ephrata, Wash., plans to spend over $3,000,000 for improving water supply. Work will include storage, wells, pumping units and pipe lines.

Power House—U. S. Engineers, Tulsa, will open bids April 15, for power house and installing equipment for the Tenkiller. Ferry Dam on Illinois River in Oklahoma. Cost is estimated at $2,225,000.

High School—Sequoia Union High School District, Redwood City, Calif., received low bid for constructing San Carlos-Belmont School from William & Burrows, Burlingame, at $1,779,500.

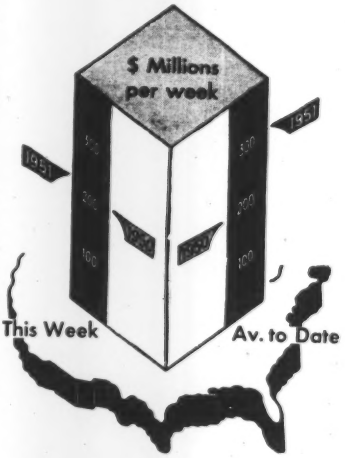
COSTS AND VOLUME

ENR INDEX NUMBERS

Index Base = 100	1913	1926	1949
Constr. Cost. Mar. '51	537.90	258.57	112.76
Bldg. Cost... Mar. '51	397.99	215.14	113.13
Volume .....Feb. '51	653	265	189

Activity This Week

As reported to ENR (in millions of dollars)



Amount of contracts let

Week of Mar. 15 '51	This Week	Cumulative 11 wks 1951	Cumulative 11 wks 1950	% chge
Federal	$12.0	$430.3	$366.8	+17
State & Mun.	69.1	746.0	595.7	+25
Total Public	$81.1	$1,176.3	$962.5	+22
Total Private	139.7	2,193.4	1,196.4	+83
U. S. Total	**$220.8**	**$3,369.7**	**$2,158.9**	**+56**

Contracts by type of work

	This Week	Cumulative 11 wks 1951	Cumulative 11 wks 1950	% chge
Waterworks .	$5.1	$42.2	$58.2	−27
Sewerage ...	5.8	69.1	47.7	+45
Bridges	2.0	58.6	68.1	−14
Highways ...	18.0	193.0	184.5	+5
Earthwork, Waterways .	13.3	65.6	66.6	−2
Buildings:				
Public	20.9	510.6	425.6	+20
Housg., pub.	11.9	148.2	34.1	+335
Housg., priv.	35.6	463.7	686.5	−32
Commercial .	10.2	163.4	194.7	−16
Industrial ..	54.3	1,376.0	214.9	+540
Unclassified..	43.7	279.3	178.0	+57

NOTE: Minimum size projects included are: Waterworks and waterways projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction

	Cumulative 11 wks 1951	Cumulative 11 wks 1950	% chge
Corporate Securities	$441.5	$436.7	+1
Fed. loans, Priv. Constr.	73.4	0	0
State and Mun.:			
Excl. housing....	453.0	335.4	+35
Housing	162.8	160.4	+1
Fed. Aid, non-fed. constr.	0	0	0
Total Non-Federal.	$1,130.7	$932.5	+21
FEDERAL	2,602.4	0	0
Total Capital	**$3,733.1**	**$932.5**	**+300**

Truman asks extra construction funds

President Truman has transmitted to Congress requests for $1,454 million in cash and borrowing power to speed defense production and civil defense programs.

He asked $51 million in appropriations and $1 billion in borrowing authority for defense production, and $403 million for civil defense.

The $51 million is needed to finance the 11 agencies administering the Defense Production Act, and the Economic Stabilization Agency, he said. The $1 billion in borrowing authority was asked in connection with government agencies entering into direct loans, purchase agreements and loan guarantees for building defense plants and equipping them.

Of the $403 million requested for civil defense, $128 million is for operations, $250 million for protective facilities and $25 million for a procurement fund.

These requests do not include any money for military or defense public works; appropriations for these are expected soon in a huge multi-billion defense bill.

In a separate request, President Truman also asked for $242,165,024 for supplemental appropriations for fiscal 1951. About $21 million are earmarked for construction. Included are the following items:

$1,470,000 for acquisition and remodeling of a building in New York City for the use of the U. S. information and educational program; $1,380,000 for a combined heating and power plant at the Atlanta Penitentiary; $5,000,000 for U. S. Forest Service for construction of access roads to timberlands in national forests; $800,000 for roads, trails and bridge repairs in Oregon and California; $3,500,000 for Bureau of Public Roads for Tongass Forest highways in Alaska and $750,000 for public lands highways; $4,500,000 for replacement of equipment of the Alaska Railroad which was destroyed by fire this year; $350,000 for improvements to Bureau of Mines pilot plant at Laramie, Wyo.

ELECTED PRESIDENT—Fred J. Driscoll, head of the George F. Driscoll Co., general contractors, is the 14th president of the Building Trades Employers' Association of New York City. He stated that the industry is better prepared to meet defense construction demands than it was at the start of the last war.

Slum clearance bill up before N. C. legislature

To help cities and towns clean up slum areas, and authorize them to redevelop any areas they see fit, a bill has been introduced in the North Carolina state legislature authorizing local governments to establish redevelopment authorities.

The proposed bill would give the authorities power of eminent domain to condemn and take over property. They would be able to take advantage of financial aid from the federal government under Title 1 of the Federal Housing Act of 1949, and be responsible for planning and executing rehabilitation in slum areas.

The development authorities would not have power to finance their program on the property they obtain. Under the proposed bill they would either resell it or lease it, keeping the development program within the area of private enterprise.

State creates school body to finance new building

The Georgia Legislature has passed a bill creating a state School Building Authority which can issue revenue bonds to construct school buildings. No limit has been placed on the amount the authority can borrow, although one legislator, House Speaker Fred Hand, author of the bill, expects cities and counties to finance $180,000,000 of improvements under the provisions of the law.

Dwelling unit study finds one-third substandard

An intensive study of the Triangle, University, Temple, West Poplar and Passyunk redevelopment areas of Philadelphia has found one-third of all dwelling units in those areas substandard.

The survey of the 32,500 family areas was jointly made by the City Planning Commission, the Redevelopment Authority and the Philadelphia Housing Authority to guide them in their work. Many of the houses dated back to 1880.

Tax concession lack delays National Steel

Failure of the federal government to grant tax concessions is reported to be delaying plans of the National Steel Co. to build a $300 million steel mill at Thorofare, N. J.

National Steel had hoped to break ground for its new eastern mill soon after U. S. Steel started work on its mill near Morrisville, Pa. (ENR Feb. 22, p. 25). But a spokesman for the company said last week that work would be delayed indefinitely.

The spokesman declared National Steel has not yet obtained a government certificate which would allow tax concessions during a five-year period of construction and operation. Without these concessions, the company "would not want to invest millions in a plant which would produce one million ingot tons of steel a year."

Gen. W. M. Hoge, Engineer, commands U. S. 9th Corps

Maj. Gen. William M. Hoge, civil engineer, who has been commander of U. S. troops in Trieste, has gone to Korea to take over the command of the U. S. Ninth Corps, succeeding the late Maj. Gen. Bryant E. Moore, who died Feb. 24, after a helicopter crash at the front.

General Hoge was graduated from West Point in 1916 and was commissioned a second lieutenant in the Corps of Engineers. In the first world war he was decorated with the Silver Star and the Distinguished Service Cross. Following the war, he served in the district engineer's office at Kansas City. He then studied at Massachusetts Institute of Technology and later served in divisional engineering work.

He worked on the Alaskan highway from its beginning to September, 1942, when he was assigned in succession to the 8th and 9th Armored Divisions. The 5th Engineer Special Brigade, under his command, supplied the troops which took Omaha Beach in Normandy.

The highlight of General Hoge's wartime accomplishment was the capture of the Ludendorff Bridge at Remagen, which was our first bridgehead across the Rhine.

Employees pension funds used for state buildings

The California Legislature has passed and Governor Earl Warren has signed a bill which will permit the investment of funds of the state employees' retirement system and the teachers' retirement system for the construction of a $5,500,000 motor vehicles building and a $900,000 highway patrol building, in Sacramento.

Puget Sound bridge reported feasible

A new report by Charles E. Andrew, consulting engineer for the Washington State Toll Bridge Authority, adds confirmation to his earlier report that bridging Puget Sound west of Seattle is feasible from both engineering and financial standpoints.

The new report is based on field surveys and preliminary studies of design made in the last year since the state highway department allocated $75,000 to the authority to continue work Andrew initiated several years ago. The 1951 state legislature is expected to appropriate funds to bring the project to the construction stage. (ENR Feb. 22, page 24)

"Earnings for the first year of operation, as estimated, are approximately two and a fourth times the debt service," Andrew declared. Fares of 80 cents for passenger automobiles and 15 cents for passengers would bring about $4,500,000 the first year, he estimates, with income expected to grow thereafter as the bridge leads to cross-Sound developments. The bond issue could be retired within 17 years after the construction has been completed, Andrew believes.

Tolls would be collected only on the main crossing, with four routes suggested, three of which would use either Vashon or Bainbridge islands as a stepping stone to the Kitsap mainland. Each of the crossings calls for smaller bridges over passages and arms of Puget Sound on the Kitsap side to funnel traffic onto the main crossing.

Costs of the various projects, involving floating bridges and submerged tubes, would range from $60,000,000 to $72,000,000.

"On a conservative basis," says Andrew, "our figures show that potential traffic and income would be considerably higher than that required to support any of the preliminary estimates, thus affording a relatively large cushion against errors in judgment as to traffic volume, and allowing a substantial reserve."

Bond-holders seek control of Delaware crossings

Legislation prohibiting construction of any bridges along the length of the Delaware River between Trenton and Philadelphia unless built under the aegis of the Delaware River Joint Toll Bridge Commission is before the Pennsylvania state legislature.

Bond-holders of the commission claim that money currently invested was loaned on the basis of motor traffic crossing the Delaware River. Any bridges built draining such traffic revenues is detrimental to their interests, they say.

Extension of the Pennsylvania Turnpike from King-of-Prussia, its present eastern terminal, to an intersection with the New Jersey Turnpike in the vicinity of Bordentown may be affected if the law goes through.

The turnpike extension would have included a bridge over the Delaware not far from the current bridge project of the river commission linking Trenton, N. J. and Morrisville, Pa. Bridge commission spokesmen say they might agree to a turnpike bridge if it could be operated by the commission or an arrangement be made giving the commission a share in the revenue from the crossing.

IN THE EVENT OF AN
ENEMY ATTACK ON NEW YORK CITY
THIS HIGHWAY
WILL BE CLOSED
TO ALL TRAFFIC EXCEPT
CIVIL DEFENSE & MILITARY VEHICLES

SIGN OF THE TIMES—New sign being placed along a Long Island highway gives motorists warning that the road will be closed in the event of an enemy attack upon metropolitan New York, to expedite the movement of military and civil defense vehicles. (Acme photo)

N. C. needs millions for roads, survey shows

The North Carolina State Highway Commission has completed a survey which shows that it would take more than $305 million to bring 4,000 miles of the state's important roads up to 1951 standards.

The commission said that 69 percent of the state's primary roads are inadequate for current traffic demands, and the ratio of deficiencies is growing. The state has about 10,520 miles of primary roads outside incorporated towns and cities.

The comprehensive survey covered 4,085 miles of the most important roads and the cost of improvement cited applied to these. It was stated that the cost of the remaining 6,415 miles would not be as great.

The number of vehicles in the state has increased from 474,081 in 1930 to 1,171,206 last year.

San Diego starts survey on trans-bay tunnel

A feasibility survey on the proposed tunnel to connect the transbay cities of San Diego, Calif. and Coronado will be started soon by Ralph Tudor, San Francisco engineering consultant. Councils of both cities appropriated $2,500 each for the survey.

The findings by Tudor are to be ready before the California state legislature adjourns and will provide the basis for a decision on whether the state should undertake the project under the direction of its State Toll Bridge Authority.

North Carolina turnpike is recommended

A committee named by Governor W. Kerr Scott of North Carolina in February, 1950, to study the advisability of building a turnpike across the state, recommended in its formal report, just submitted, that the legislature, now in session, pass enabling legislation to create a State Turnpike Authority.

The turnpike would be a toll road across the Piedmont section of the state, but the Turnpike Study Committee said that a preliminary study of the proposed project indicates that "the financing of the project on a self-liquidating basis probably would not be feasible."

However, the committee added: "With the construction of the West Virginia Turnpike and a short connection through the state of Virginia, the traffic situation in the Piedmont section would be . . . different." . . .

Citizens fight water plant just started in Chicago

Residents of Chicago's North Side have begun legal proceedings to stop work on pilings now being driven for the new $85 million water filtration plant to be erected on 65 submerged acres in Lake Michigan north of Navy Pier.

Citizens charge the proposed plant will impair the beauty of the lake front and lower near North Side property valuation.

Permit for construction was issued Jan. 19 by the Army after a public hearing. The work has the approval of the Chicago City Council, the city's Park District, and the State of Illinois.

Civic leaders back plan for Indiana waterway

Leaders of government, business and organized labor in Indiana have supported with enthusiasm the state-backed plan for a $9,000,000 public waterway and docking installation on Lake Michigan just east of Gary, Ind., before a six-man board of Army Engineers.

Proponents estimate that the harbor, waterway and allied docking and ferry installations could handle 5,000,000 tons of bulk cargo annually, and provide transportation of trucks and autos via a ferry to the upper reaches of Lake Michigan.

If it approves the project, the Army would dredge the channel and construct breakwaters. Private industry, under state direction, would develop the harbor facilities.

Statements were taken under advisement by the Army board.

Two states study streams for pollution control

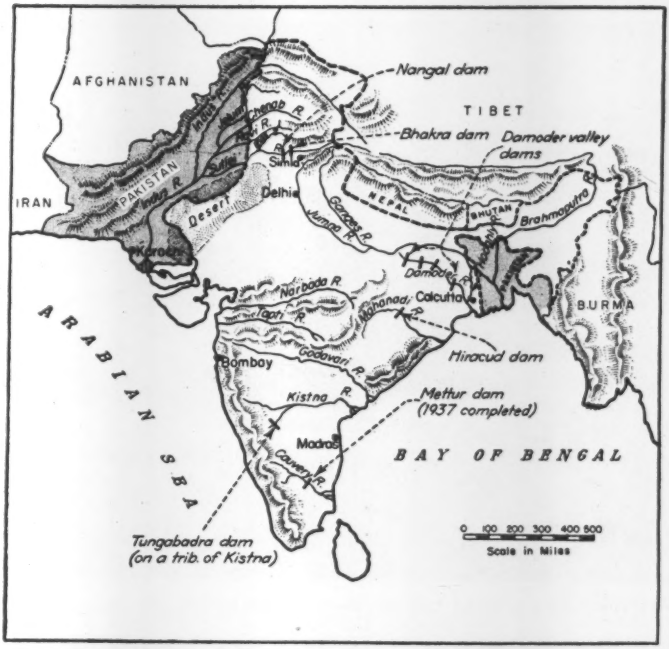
Both Massachusetts and New Hampshire are busy with legal action to promote cleaner streams in their respective states.

In New Hampshire—seven stream classification bills have been submitted to the legislature by the State Water Pollution Commission.

The seven bills recommend classification of about 3200 miles of waterways in recreational areas of the state. They provide for high purification of the waters.

In Massachusetts—six bills have been introduced at the present session of the legislature providing for investigation and study of sewage and industrial waste disposal in certain state rivers.

The Department of Public Health would be responsible for the conduct of the investigation.



KEY DAM JOBS IN INDIA—This map should have been published with the article "India Stakes Future on Her Rivers" (ENR March 1, 1951, p. 32). Through a printer's error, the map that was used did not show the dam locations. The four projects, whose completion is so vital to India's growth and improvement, comprise (1) Bhakra and Nangal Dams on the Sutlej River; (2) four dams on the Damoder River; (3) Hiracud Dam on the Mahanadi River; and (4) Tungabadra Dam on a tributary of the Kistna.

Install giant pumps at Grand Coulee

With the setting of four 25¼-ton section for the 65,000-hp. motor, work is proceeding on schedule for the start of operation about May 1 by the world's largest pump. This pump will lift water 280 ft. above the lake behind Grand Coulee Dam in north central Washington into a storage reservoir for delivery next year to the Columbia Basin irrigation project.

The four sections comprise the circular stator which General Electric Co. men now are assembling under the direction of Joseph A. Kadletz, supervising engineer. Work on the assembly of the first pump started six months ago and assembly of the first motor about three months ago.

Bureau of Reclamation crews have begun the assembly of the second pump, with work soon to start on the third. A total of six pumps is scheduled for completion by the fall of 1952.

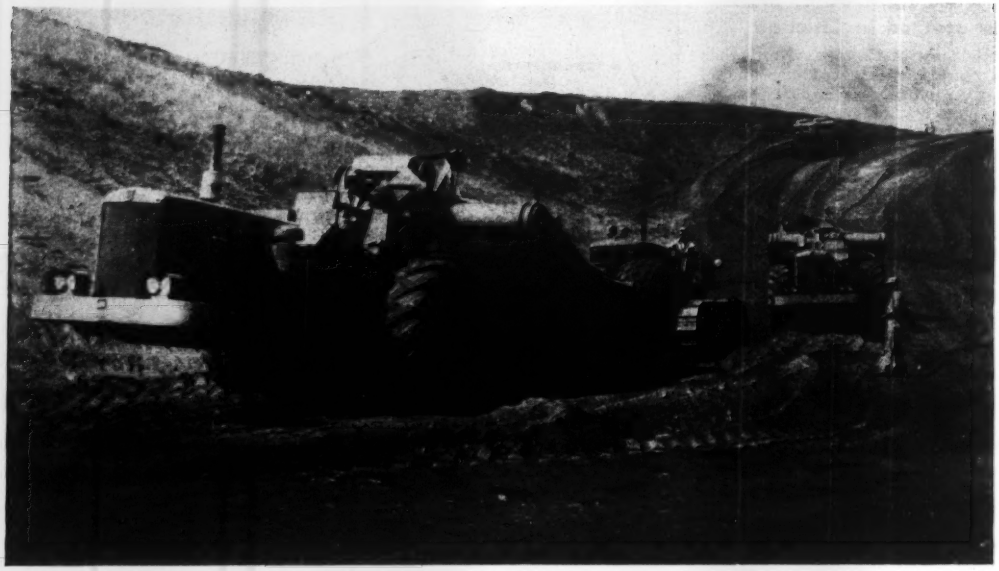
The Pelton Water Wheel Co. of San Francisco and the Byron Jackson Pump Co. of Los Angeles have the contract to furnish the pumps, for $1,150,675. General Electric Co. has an $858,153 contract for the first two motors, with the Westinghouse Electric Corp. to supply the next four for $1,617,350. Twelve pumps and motors eventually will be installed in the $13,982,593 pumping plant.

Engineers postpone work on three NE reservoirs

Endorsement of a $17,000,000 network of seven reservoirs in southern Massachusetts, eastern Connecticut and western Rhode Island by Col. H. J. Woodbury of the New England Division, Army Engineers, Boston, has been withdrawn because of present high costs.

Postponement of work on three of the control reservoirs has been recommended in a report to the Chief of Army Engineers.

The original proposal was for four reservoirs in Massachusetts, and three in Connecticut.



Powerful equipment carves steep haul roads, then . . .

Dirt really flies at Oahe Dam

BY THE TIME freezing weather shut the job down, over 700,000 cu yd of rolled-fill and over 1,500,000 cu yd of shale berms had been placed in the embankment of Oahe Dam since work started in July.

Two methods of earthmoving were followed in this Corps of Engineers' element of the Missouri Basin development. Overburden and glacial till were handled by a subcontractor, weathered shale by the general contractor (see accompanying table of major earth moving equipment).

When the job got under full steam the two outfits moved a total of 30,000 cu yd per day (two 10-hr shifts each), with an average haul of 2,500 ft. Sealed-beam searchlights and incandescent cluster lights mounted on 70-ft poles surrounding the working area, together with mobile tower floodlights, gave plenty of night time illumination.

• **Supercharged engines**—The earth movers are powerful rigs, needed to keep on schedule over the steep haul roads, some of which are on 8% grade. The 210-hp diesel engines in the bottom-dump wagons and those on the power shovels came off of Cherry Creek Dam near Denver, Colo. On that job, they were all supercharged with a forced fuel draft, for operating at elevations above 5,000 ft.

Although these supercharged engines consumed more fuel, they developed enough increased power at Oahe (El. 1,425) to pay their way.

• **Big one**—Oahe Dam is the fourth major unit to be started on the Missouri River under the Pick-Sloan plan, and ranks right along with its predecessors—Fort Peck, Garrison and Fort Randall—both as to size and operational features.

As shown in the accompanying table of comparative features of the four main-stem dams, Oahe will afford more water storage and develop more hydro-power than any of the other three. And its volume of earth embankment will be second only to that of Fort Peck, which was placed hydraulically.

TABLE OF MAJOR EARTH-MOVING EQUIPMENT

General Contractor:

Four 4½-cu yd Lima shovels
Ten 25-cu yd Euclid bottom-dump wagons

Subcontractor:

Six 15-cu yd Tournapulls
Four 20-cu yd Tournapulls
Five 15-cu yd scraper-tractor combinations
One Adams elevating grader
Eight 5-cu yd dump trucks
Allis-Chalmers HD-19 and Caterpillar D-8 push-tractors

Oahe Dam and reservoir is located on the Missouri River 6 mi upstream from Pierre, S. D. It lies between Fort Randall dam, downstream near the South Dakota-Nebraska border, and Garrison Dam, 80 mi above Bismarck, N. D. At maximum pool elevation, the reservoir will extend nearly to Bismarck—about 250 river miles.

Power facilities will be located in the left, or east, abutment; outlet works will be in the right abutment; and the spillway (chute type uncontrolled, ogee crest) will be located about a mile west of the outlet works.

• **Selecting the site**—Site selection for Oahe was based on four factors: River banks are firm and underlain with a good shale foundation; the Missouri is relatively narrow at this point—about 4,000 ft wide at normal flow; a huge reservoir is possible without the danger of flooding-out large cities or communities; the site selected offered the greatest economies in construction.

One large economic advantage was secured by locating Oahe Dam so near Pierre. Many of the construction workers and government employees—estimated to reach 3,000 during peak construction—will find food and shelter in town. This will avoid the neces-

sity for building such large housing projects as Riverdale at Garrison Dam or Pickstown at Fort Randall Dam.

Other facilities such as theaters, schools and churches are expected to be furnished by private industry in Pierre. The government has provided some housing—52 rehabilitated wartime housing units at Pierre Airbase, and 50 new units inside the city.

• **Will irrigate 750,000 acres**—Although Oahe Dam and reservoir is primarily for flood control and hydroelectric power it will furnish much-needed irrigation waters for the James River valley, to the east. Ultimate plans are to transfer 2,000,000 acre-ft of water yearly to the James River for the irrigation of 750,000 acres. Canals and irrigation works will be built by the Bureau of Reclamation.

• **Initial construction**—Three contracts awarded in 1948 covered the construction of an access highway on the west side of the river, and modification of housing facilities at Pierre airfield for the government employees at the dam.

The current contract of $2,280,000 for Stage I embankment was awarded last May. The contractor moved in and carved out 5 mi of haul roads on the west side of the river in about 3 weeks.

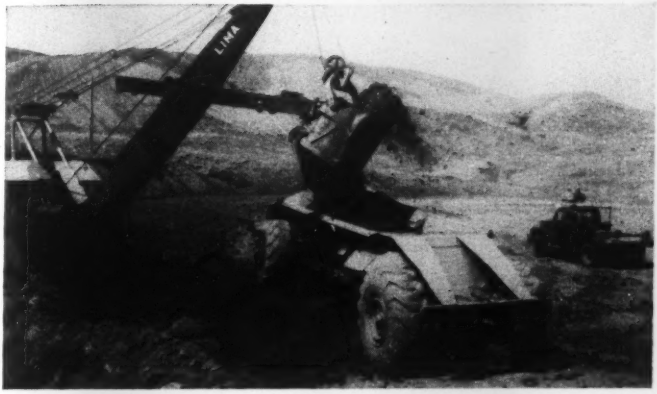
One-way haul roads are 40 ft wide; two-way stretches of road are 60 ft wide. Average grades are 5%. After completion of the initial haul roads, the next step was to clean off the west bank of the river down to good firm shale; also to build an impervious cut-off trench through the glacial till to be left in place as part of the upstream side of the right abutment.

• **Make-up of embankment**—The rolled-fill embankment contains four different kinds of material, placed in four zones.

Starting at the upstream face, Zone I is an impervious material composed of silt, clay and silty clay. Zone I constitutes about one-third of the total embankment. The other three zones are pervious material of glacial till. Zone II is a gravelly and sandy clay; Zone III a clayey sand and gravel, and Zone IV sand and gravel. The three classes of material get progressively more pervious from Zone II to Zone IV.

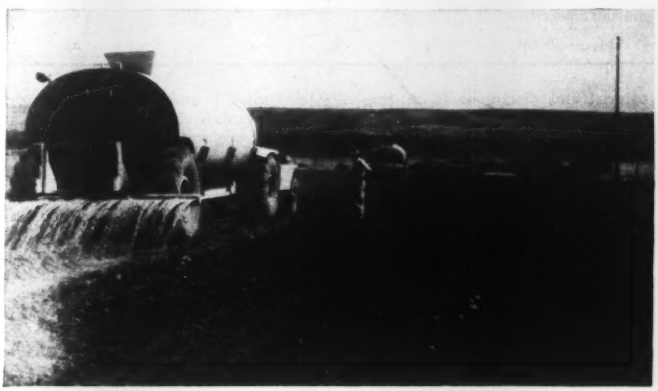
Both the upstream and downstream faces of the embankment will be protected by heavy berms of disintegrated shale removed in excavating for the approach channels. These berms will be carried up about two-thirds the height of the embankment.

• **Building the embankment**—A simple but effective method of classifying the

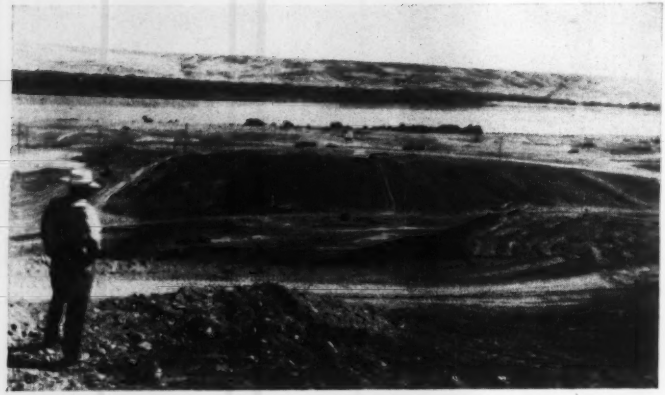


SMALL MOUNTAINS of weathered shale—too tough for self-loading scrapers—were whittled down by 4¼-cu yd shovels and dispatched to the embankment area in 25-cu yd bottom-dump wagons. Shale will be formed into berms to protect embankment faces.

SUPERCHARGED TRUCKS bulled their way through knee-high windrows of shale to drop their 25-cu yd loads in place, which were promptly leveled by bulldozer and kneaded with a giant spike-tooth roller.



SHOOTING OPTIMUM MOISTURE FOR 90% or better compaction called for plenty of water and thorough processing with scarifiers and sheepsfoot rollers.



STAGE I of the main embankment has begun to take shape down in the river valley—ultimately it will be 242 ft high and contain 78,000,000 cu yd of rolled earth fill and shale berms. Stage I involves 6,000,000 cu yd of fill, 5,600,000 cu yd of excavation.

TABLE OF COMPARATIVE SIZES

	Oahe	Fort Randall	Garrison	Fort Peck
Rolled Fill Embankment:				
Volume (cu yd)	78,000,000	28,000,000	70,000,000	125,628,288*
Height (ft)	242	160	210	250.5
Crest length (ft)	9,300	10,500	12,000	21,026
Reservoir (Max. pool):				
Dead storage (acre-ft)	5,500,000	1,400,000	4,900,000	617,000
Flood control (acre-ft)	3,500,000	2,500,000	4,250,000	1,012,000
Multiple storage (acre-ft)	14,600,000	2,400,000	13,850,000	17,783,000
Total (acre-ft)	23,600,000	6,300,000	23,000,000	19,412,000
Area (acres)	376,000	118,400	390,000	245,000
Spillway:				
Capacity (cfs)	319,000	601,000	827,000	250,000
Outlet works:				
Flood-control tunnels (ID)	Six 18½-ft	Four 22 ft	Two 22 ft; One 26 ft	Three 24 ft 8 in.
Power Facilities:				
Tunnels (ID)	Five 23 ft	Eight 22 ft	Five 29 ft	One 24 ft 8 in.
Initial power (kw)	168,000	160,000	240,000	50,000
Ultimate power (kw)	420,000	320,000	400,000	105,000
Project Cost (est)	$234,000,000	$166,000,000	$202,000,000	$136,900,000
Completion (est)	1959	1954	1955	1955

* Hydraulic fill

material and placing it in its proper zone was devised by the contractor and the Corps of Engineers. It worked like this:

All material was classified as it came out of the borrow pits. To insure each load being delivered to the proper zone, colored flags were mounted on the scrapers, trucks and wagons. A red flag meant Zone I, yellow Zone II, blue Zone III, and orange Zone IV. Stakes with corresponding colors marked the limits of the zones in the embankment. They were pulled and re-driven after each lift.

The entire operation ran like clockwork; neither the equipment operators nor the embankment inspectors had any difficulty getting the right load of excavation into the proper zone.

Tractor-mounted rakes and labor crews removed all rocks larger than 10 in. from the fill, which then was watered and scarified and compacted with sheepsfoot rollers to 90% or greater density at optimum moisture content, according to modified AASHO requirements.

Special treatment was given the disintegrated shale forming the berms on both faces of the embankment. This shale is relatively durable when first uncovered, but disintegrates when exposed to air. To insure disintegration of the blocks, all shale in the berms was worked over with a gigantic spiked-tooth roller, furnished by the Corps of Engineers. The roller, weighing 60 tons and containing 18-in. spike was pulled by a crawler tractor.

• **Short working season**—One reason for rushing Stage I of the embankment construction is the relatively short working season in that part of the country. Winter weather usually shuts down such work from late November to early April. This means that although the contractor's completion date for Stage I embankment—totaling 6,000,000 cu yd of fill and 5,600,000 cu yd of excavation—is Mar. 15, 1952, he will have to finish the job during the 1951 construction season.

• **Contract prices**—The contractor's belief in big equipment for economical operation is reflected in his unit bid prices. They are: removal of overburden and shale, $0.35 per cu yd; glacial till from borrow pits, $0.33 per cu yd; processing in compacted area, $0.05 per cu yd; placing material in uncompacted area, $0.03 per cu yd; removal and stockpiling of boulders over 10-in., $0.80 per cu yd; and water for sprinkling, $1.00 per M gal.

• **The over-all plan**—Under normal conditions and assuming that adequate federal appropriations will be forthcoming, the over-all plan contemplates 10 years for completion of the Oahe dam, reservoir and appurtenant works. This year should see the completion of Stage I embankment and access rail and highway facilities.

Tunnelling probably will be started in 1952 and completed the following year. During this two-year period, the embankment will be brought up to a low level, with river closure made in 1954 or 1955. Construction of the spillway and power plant probably will be started by 1956, and the entire project completed by the end of 1959.

• **Engineers and contractors**—Oahe dam was designed by, and is being built under the supervision of the Omaha District, Corps of Engineers. Col. Henry Hoeffer is district engineer; Lt. Col. A. D. Starbird, area engineer, assisted by Llewellyn G. Leavitt; and L. R. Crist is resident engineer.

Guy H. James Construction Co., Oklahoma City, is the general contractor for Stage I embankment, under a $2,280,000 contract. Francis Bleecker is general superintendent and Pat Stewart, dirt superintendent. Overburden and glacial till are being handled by Collins and Campbell, Fargo, N. D., under a subcontract. John Beck is their general superintendent.

Rigid-frame bridge of prestressed concrete

A FOOTBRIDGE of rigid-frame construction has been built of prestressed concrete in Oxford, England. It spans 45 ft over a branch of the Cherwell River.

The structure consists essentially of two cast-in-place rigid frames and a deck of prestressed, precast concrete plank. The rigid frames are braced at midspan by a cross beam and at the vertical legs by a thin wall. Width between rails is 8 ft and clear height above mean water level is 5 ft 9 in.

The horizontal portion of each frame is a 12-in. wide arched beam, only 9 in. deep at the crown. Haunches are 5½ ft deep. Prestress is applied to the beam by a pair of cables located near the bottom at midspan and near the top at haunches, to counteract dead and live-load bending moments at these sections. Similarly, tensioned diagonal cables counteract bending stresses in the haunches.

Vertical legs are prestressed by a pair of cables, the ends of which are anchored with wedges at the top of the abutments. Looped through the footings, the cables are anchored by bond there.

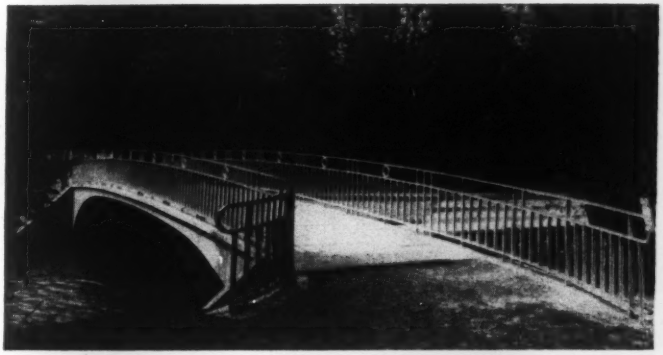
Concrete had a 28-day strength of 6,000 psi. The mix contained 112 lb of portland cement, 177 lb of sand and 335 lb of ¾-in. aggregate, with a water-cement ratio ranging from 0.48 for foundations and vertical legs to 0.50 for other components.

The Freyssinet system was used for prestressing (ENR Sept. 1, 1949, p 183). To prevent bond with the concrete, each cable was sheathed in light-gage metal tubing, which came in 2-ft lengths. Joints between sections were bound with tape to prevent leakage of grout, which was injected after the cables were stressed.

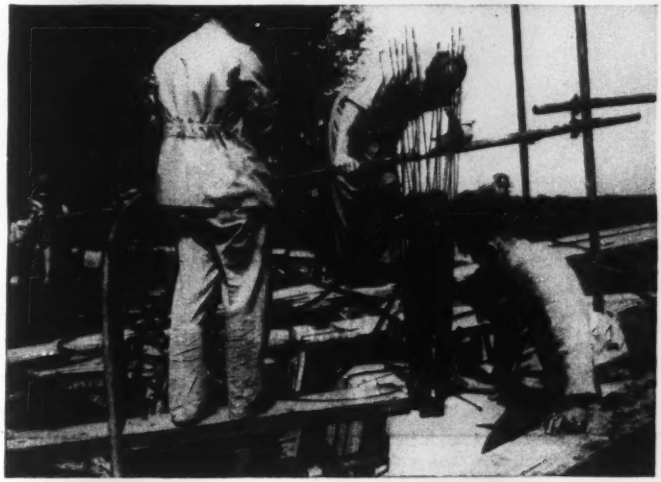
After the concrete had hardened, cables were tensioned with a double-acting jack. One stroke applied the stress; the second anchored the wires by forcing a conical concrete plug into a conical opening to wedge them in place. With two jacks in use, tensioning took 9 hours. Vertical cables were stressed first, then the diagonals and finally the horizontals.

After the prestressing, the cross beam and wing walls were cast. Finally, decking was placed and aluminum railing installed.

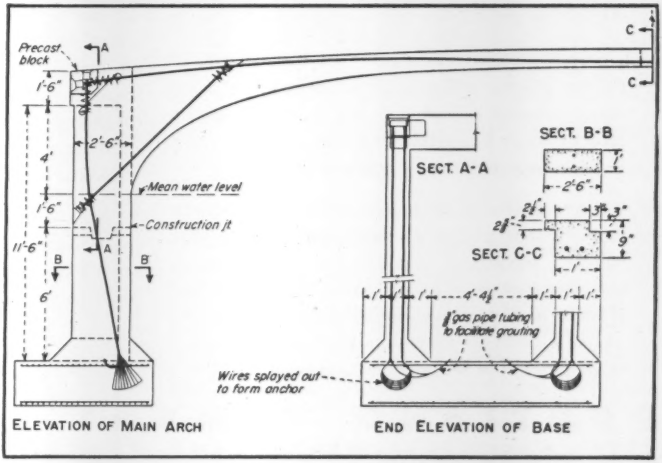
The bridge was built for The Chancellor, Masters and Scholars of the University of Oxford. R. Travers Morgan & Partners supervised design and construction. Taylor Woodrow Construction, Ltd., was the general contractor.



CONCRETE BRIDGE in Oxford, England, has a prestressed deck and frame.



DOUBLE-ACTING JACK applied prestress, drove wedge to anchor wires.



RIGID FRAME was prestressed by vertical, horizontal and diagonal cables.

In Sheboygan, Wisconsin, maintenance costs are lowest on CONCRETE STREETS

Sheboygan, Wis., paved its first street with concrete in 1911. Today two-thirds of the total street mileage is concrete.

Writes C. Fred Calhoun, President, Board of Public Works, "We in Sheboygan know a lot about concrete pavements. We've kept accurate records so we know that concrete pavements cost less for upkeep than any other type."

Latest available Sheboygan street maintenance records, spanning a 15-year period, show that concrete pavements cost an average of $85.92 per mile per year to maintain. The other two types of pavement average $314.09 and $608.04 per mile per year to maintain. That's 3⅔ and 7 times more than for concrete streets!

Sheboygan's experience with *low-maintenance-cost* concrete streets is shared by cities from coast to coast. Yet low maintenance is only one concrete pavement economy that pleases motorists and taxpayers. Concrete usually costs less to build than any other pavement of equal load-carrying capacity and it serves longer. These three factors, moderate first cost, low upkeep and long life, result in ***low-annual-cost*** pavement.

For more information about ***low-annual-cost*** pavement, write for free booklet, "*Design of Concrete Pavements for Municipal Streets.*" Distributed only in the United States and Canada.

●

Upper photo, Sixth Street, more than a quarter of a century ago. Lower photo, Sixth Street today from the same location.

PORTLAND CEMENT ASSOCIATION

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A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

PAVING A HIGHWAY near Russell, Kan.—one of Kansas' six concrete test pavements containing coarse-ground cement.

How Kansas built a concrete test pavement

SIX TEST PAVEMENTS were built last year by the Kansas State Highway Commission, as a continuation of its studies to develop a tougher concrete pavement by using a coarse-ground cement, together with certain modifications in the methods of construction.

The first three projects, totaling 23¾ miles of 24-ft and 22-ft pavement, for which contracts were awarded early in 1950, were located near Russell, Great Bend and Dodge City. Contracts for the other three projects totaling 13 miles and located near Chanute, Emporia and Troy, were awarded later in the year (ENR Aug. 10, 1950, p. 17).

Objectives of the program together with design specifications and construction requirements for the first three jobs have been reported in detail (ENR, June 22, 1950, p. 34). The following covers construction procedures used only on the work near Russell:

There are four kinds of concrete in this 6.5-mile test pavement: 0.8 mile of pavement using air-entrained regular-grind Type I portland cements; 0.8 mile of pavement made with regular-grind Type I portland cements but without entrained air; 1,000 ft of air-entrained concrete pavement made with coarse-ground cements; and the remainder of the pavement 4.7 miles) made with coarse-ground cement containing no air-entraining agent.

Contract prices were no higher than average for that area of Kansas. There were three major contract items: common excavation, $0.29 per cu yd; granular subbase, $0.15 per sq yd; and 9-in. reinforced concrete pavement, $3.83 per sq yd.

The two major departures from customary practice with which the contractor had to contend were consolidating the concrete and installing the contraction joints. Specifications required the concrete to be tamped instead of vibrated. They also required three out of every four contraction joints to be cut in the hardened concrete.

• **Job-made tamper**—The tamping machine was job-made. It was mounted on a conventional transverse finishing machine, between the front and rear screeds. The tamping head, extending across the full width of the 22-ft pavement, had a 4x⅜-in. face plate on the bottom. Two 3x⅜-in. plates were welded to the top of the face plate, and to the outside of two 4-in. vertical channels, previously welded toe-to-toe of flanges to form a box section.

This all-welded tamping head was heavy enough to impart the required compaction to the fresh concrete. It also was sufficiently rigid that only four diaphragms were needed to attach it to four eccentric connections mounted on a 2-in. shaft supported by the frame of the finishing machine.

A 2-cylinder air-cooled engine operated the tamper at a rate of 9 blows per lineal foot of pavement, and to a penetration of ½ to ¾-in. per blow.

• **How they cut joints**—Cutting the transverse 2x⅛-in. contraction joints was a simple job, once the proper procedure had been worked out and the joint crew had become familiar with the equipment. Contraction joints were spaced 20 ft apart; with every fourth one being formed in conventional manner by inserting a 2x⅛-in. flexible strip in the fresh concrete. The remaining joints were sawed and filled with a cold-poured compound.

The contractor soon learned two things about sawing the joints: The faster a joint was cut, the less life he got out of his 12-in. diamond saw blade. Also, a blade would last much longer in hard concrete than in soft concrete—about 1,500 ft of joint could be gotten with one blade when the concrete was 20 days old, but only 400 ft if the joints were cut in 24-hour concrete.

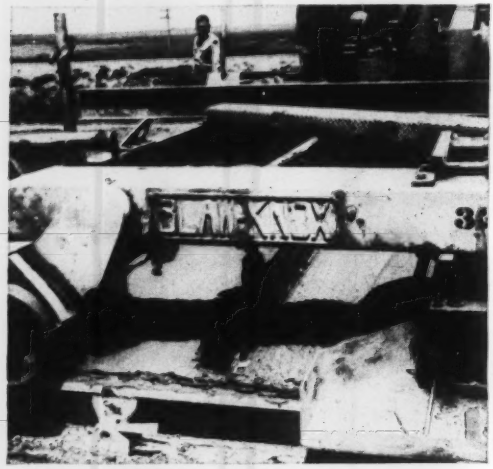
A 2x⅛-in. contraction joint could be cut across the full width of the 22-ft pavement in as little as 2 min but cutting times of 4 to 6 min per joint were found to be more economical from the standpoint of the life of the saw blade.

• **Compacted granular subbase**—The 9-in. concrete pavement was placed on a 4-in. compacted subbase, using pit-run granular material, modified with 15 to 20% of soil. It was built to a density of at least 100% of the standard compaction at optimum moisture content, by the AASHO methods.

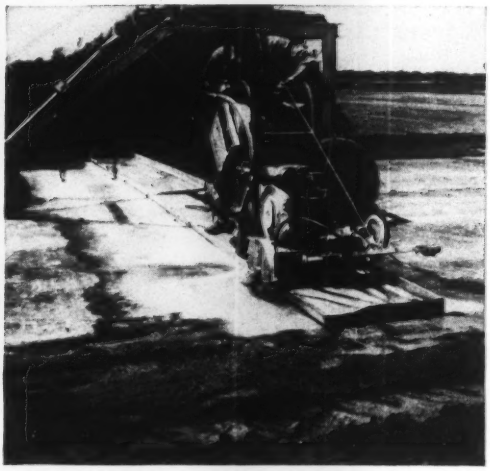
Grading was done under a previous contract. The paving contractor excavated a 24-ft wide by 4-in. deep trench to receive the subbase. The pit-run granular material was hauled in and dumped in place, and blended with trench excavation by a mechanical tiller and a patrol grader.

The subbase material was moistened

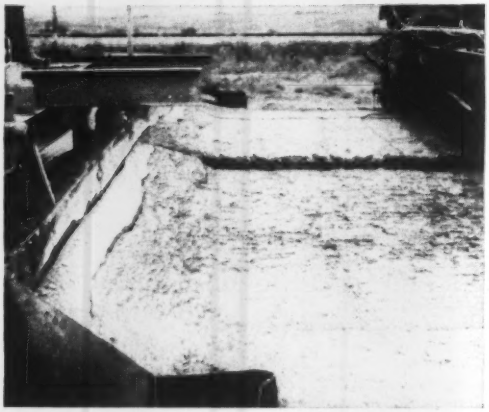
Two departures from customary practice:



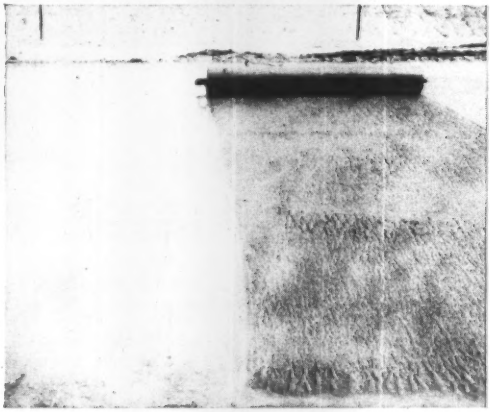
CONCRETE was mechanically tamped instead of being vibrated. The job-made tamper was mounted between the front and rear screeds of a conventional transverse finishing machine.



A CONCRETE SAW CUT three-fourths of the 2x⅛-in. contraction joints after the concrete had been cured for 21 days. Every fourth joint was formed in conventional manner.



INCREASED PLASTICITY and more workability were inherent qualities of the concrete made with air-entrained regular-grind cements. And the water-cement ratio was less.



PROFUSE BLEEDING—removed by hand roller—was characteristic of the concrete made with coarse-ground cement. But its slow-setting made finishing easier.

to slightly above optimum moisture content, to compensate for some evaporation. Then it was rolled with sheepsfoot and wobble-wheel pneumatic tired rollers, and permitted to cure at least two days before placing the concrete pavement. Subgrade construction was kept well ahead of paving—usually about two miles. The finished sub-base was sprinkled, as necessary, to keep it from drying out too much.

A form-grader prepared a level base for the forms. Reversible 8x10-in. by 10-ft long side forms were set to line and grade, from "blue-tops" driven 2 ft outside the forms at 25 ft intervals. They were pinned with a power pin-setter. The granular subbase was trimmed to a true grade by a fine-grader operating on the forms that had been made ready to receive the concrete.

The 9-in. constant depth concrete pavement was reinforced with welded high-tensile strength wire mesh weighing 44 lb per 100-sq ft. The mesh was made of #4 wires spaced 6 in. apart transversely and 12-in. longitudinally. It was placed 2½-in. below the top of the pavement. The pavement was built to a 1¾-in. modified parabolic crown.

• **Closed center line joint**—A closed longitudinal construction joint extending along the center line of pavement, was formed with a strip of 16-ga metal 8½-in. wide, preformed to provide a shear key. It was set flush with the bottom of slab, coming within ½-in. of the top surface.

This joint-forming metal strip was accurately positioned with an 11-ft templet made out of a ¾-in. rod with

a short length of 1¼x1¼-in. angle welded on each end of the rod. One angle was placed over the top inside corner of the metal road forms; the other was placed over the metal strip.

The two 11-ft lanes of pavement are tied together with ¼-in. by 36-in. dowels, spaced 2 ft 6 in. apart and extending through the construction joint. Metal chairs supported the ends of the dowels and steel pins held the metal strip in place.

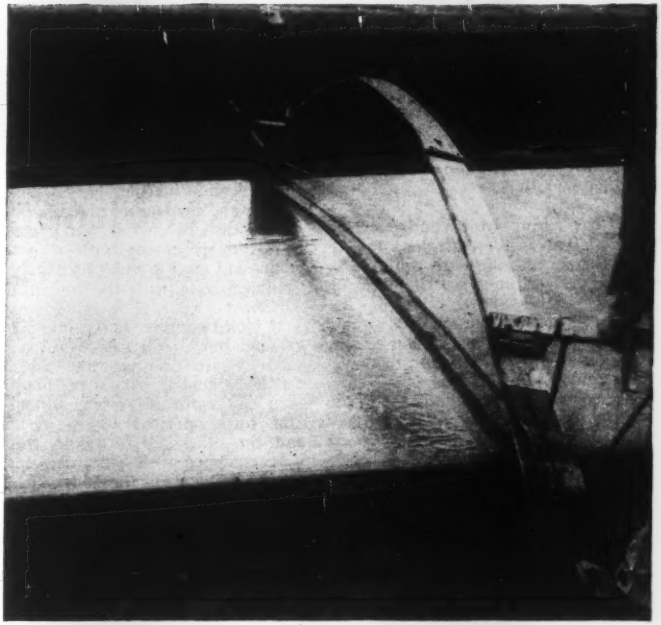
• **Sweetened aggregates** — Aggregates used in the concrete are a type of pit-run sand and gravel, peculiar to that part of the country, to which was added a coarse-graded crushed limestone for so-called "sweetening." The average proportions of the total aggregate mix per bag of cement were 344 lb of the natural sand and gravel, and 102 lb of the crushed limestone. The concrete had a slump of 1- to 2-in. Air-entrained concrete had a water-cement ratio of 5.5 gal. per bag. Non-air-entrained concrete had a water-cement ratio of 5.75.

Gradations of the pit-run sand and gravel, the added crushed limestone, and the resulting total sweetened mixture are shown in an accompanying table.

Although skeptical at first as to some of the finishing requirements, the contractor soon discovered that the coarse-ground cement concrete set-up slower, permitting more time for finishing than when using regular-grind cement. Even on hot days the manual finishing operations were performed satisfactorily several hours after placing the concrete.

TABLE OF AGGREGATE GRADATIONS

Natural Pit-Run Sand and Gravel: Screen size	Average percentage retained (by weight)
1-in.	0
¾-in.	1
⅜-in.	5
#4	12
#8	26
#16	48
#30	70
#50	93
#100	99
#200	100
Coarse Aggregate Added:	
1½-in.	0
1-in.	11
¾-in.	52
⅜-in.	92
#4	99
#50	100
Total Sweetened Aggregate:	
1-in.	0 to 5
¾-in.	10 to 40
#4	30 to 60
#30	78 to 84
#50	92 to 95



BOWSTRING-BELTING, followed by conventional hand-belting, gives a uniform and non-skid surface to the pavement.

• **Paving procedure**—Best day's work was 2,110 ft of the 9-in. by 22-ft pavement in a 10-hr shift. The paving line-up consisted of two 34-E twin-batch pavers; a conventional blade-type spreader; a twin-screed transverse finisher with the mechanical tamper; a machine to install the flexible contraction joint ribbon; a transverse hand roller; a longitudinal screed, or bull-float; hand-finishing equipment; center-line marking machine; curing operations and, finally, the contraction joint sawing machine.

The 44-ft crown width of subgrade left room for an 11-ft lane on each side of the pavement for haul roads and operation of the pavers. Materials were dry-batched at a batching plant and hauled a maximum of 7 miles to the paver in a fleet of 9 triple-batch and 32 double-batch trucks.

Although the construction specification called for the use of a mechanical tamper in lieu of a conventional vibrating screed on the finishing machine, there was some vibration of the concrete. A small internal vibrator was hung from each end of the blade spreader to vibrate the concrete next to the road forms.

Installation of the 2x⅛-in. flexible ribbon at every fourth contraction joint followed close behind the transverse finisher. The installation of this filler at 80 ft intervals was a precautionary measure to take care of any early shrinkage cracks that might have appeared.

• **Expansion joints at 500 ft**—Expansion joints, filled with ⅞-in. surfaced redwood, were installed at 500-ft intervals. Special shear-transfer devices at each expansion joint were made up of 1-in. dia by 24-in. plain rods, painted and greased on one side of the joint.

One of the characteristics of that part of the concrete pavement made with coarse ground cement, was its profuse bleeding.

Part of this excess moisture thus produced was removed with a long-handled 10-in. dia metal roller, 6 ft long, and weighing 75 lb. This roller was operated transversely behind the flexible joint machine and just ahead of the bullfloat.

Manual finishing, which followed along behind the bullfloat, included several operations. First, the pavement was brought to a smooth crown with a long-handled 10-ft aluminum straightedge. Then it was belted with a bowstring belt. Pavement corners next to the side forms were rounded with edging tools; followed by a sec-

ond belting of the concrete with an ordinary handheld belt.

Following the final belting the center line was marked permanently from a bridge traveling on the side forms. To do this, a 6-in. width of pavement along the center line was roughened with spikes driven through a timber block, then a black iron-oxide pigment was mixed in with the concrete and floated smooth.

• 21-day curing—Moist burlap curing was started as soon as the concrete had hardened sufficiently to support the burlap without marking; usually within 3 to 5 hr after depositing the concrete between the forms.

After 24-hr of moist burlap curing, the burlap was removed and the pavement was thoroughly wet down, then covered with a minimum of 4 in. of earth.

This covering was kept moistened for 10 days, and removed 10 days later before opening the pavement to traffic. The contraction joints were sawed as soon as the earth was removed.

Earth-curing of the concrete was a sizable item on the project, but it was simplified to a routine operation. Earth for curing, was taken from fill slopes adjacent to the pavement with a 1½-cu yd dragline.

The earth was dumped on the pavement and spread to a 4-in. thickness with a job-made spreader, pulled by two trucks operating along side of the pavement. The simple, but sturdy spreader was made out of a 6-in. pipe and angle-iron bracing.

After the dirt had remained in place for at least 20 days it was removed from the pavement with a patrol grader and used to build up the 11-ft shoulders flush with the top of the pavement.

It took two water tanks—one 1,000 gal and one 1,200 gal—to keep the earth moist. During the hottest weather it took 2,500 gal per hour to keep the earth properly moistened. One truck operated 10-hr each day and the other, 24 hr. Both trucks were equipped with a swiveled spray bar extending across the 22 ft width of pavement.

At various locations throughout the 6.5-mile project, permanent testing installations were installed in the four types of pavement to determine the amounts of anticipated long-time gain in strength of the concrete.

• Contractors and engineers—Peter Kiewit Sons' Co., Omaha, Neb., were the general contractors. Lawrence Krug was construction superintendent, and John Lawson, paving foreman.

Subcontractors included Barton and Sons, Tonganoxie, Kan., pavement curing; Banks Construction Co., Eldorado, Kan., granular subbase; Rock Hill Stone & Gravel Co., Sterling, Kan., pit-run sand and gravel; and Concrete Materials & Construction Co., Moline, Kan., "sweetening" material for the coarse aggregate.

Kansas State Highway engineers connected with the job included: C. O. Baker, resident engineer; H. O. Reed, construction engineer; R. L. Payton, concrete engineer; and Roland H. Williams, assistant concrete engineer. R. D. Finney is materials engineer and R. C. Keeling, state highway engineer.

C. C. Oleson, principal research engineer, Portland Cement Association, Chicago, assigned to the project as an observer and consultant, furnished all photographs for this article.

Reber S. F. Bay plan killed by report based on studies of all existing data

A REPORT, issued last week and prepared jointly by Denver consulting engineer John L. Savage and the International Engineering Co., San Francisco, has, in effect, killed the Reber Plan for developing San Francisco Bay (ENR, April 6, '50, p. 29).

The report was made is the result of a survey made for the California Assembly committee on "Tidelands Reclamation and Development, Related Traffic Problems, and Relief of Congestion on Transbay Crossing."

The Reber Plan (ENR, July 11, 1946, p. 109) has had strong popular support from various sections surrounding the bay, but the International-Savage report finds it neither functionally nor economically feasible.

The plan proposed by John Reber would convert about 85% of San Francisco Bay into two freshwater lakes accessible through locks.

Benefits claimed by proponents include: freshwater reservoirs to serve adjacent lands, increased land for industrial development, multilane roadways on the transbay dams and freshwater anchorage for ocean-going vessels.

Supporters of the plan have been active but opposition has developed (ENR Nov. 24, 1949, p. 28).

The Savage-International report is the first comprehensive engineering study of the scheme. Its conclusions will bear much weight even though sufficient time and money were not available to develop new data—the report being based on studies of all available existing data.

• Summary of recommendations—These conclusions relative to the Reber Plan, were reached by the engineers preparing the report:

1. It would cost more than twice as much as it would be worth. Ultimate benefit-cost ratio would be 0.47—based on an estimated first cost of $613,546,000.

2. The scheme would waste fresh water and could not possibly conserve it. More than 2,000,000 acre-ft of freshwater would be required annually to compensate for losses developed by the Reber Plan including evaporation, transpiration, lockage and fish ladder release. And the report doubts that the south lake would ever become fresh.

3. More thorough sewage treatment would be required than otherwise necessary.

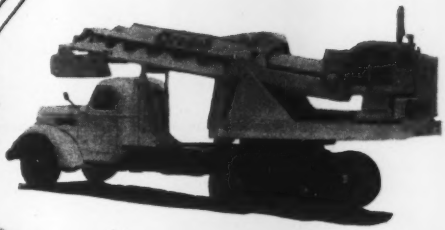
Other conclusions reached that concern individual parts of the plan or other related proposals: (1.) That a north barrier, a ship channel and a south barrier, taken individually, merit no further consideration; (2.) That a southern barrier might be practicable as a bay crossing and should be further investigated. This could be considered an endorsement of the proposed southern crossing over which there has been much controversy in recent years (ENR Feb. 13, 1947, p. 3); (3.) That the entire question of salinity protection in the delta region should be further investigated; (4.) That an additional crossing of San Francisco Bay between San Francisco at the west and Oakland or Alameda at the east end must be constructed in the near future.

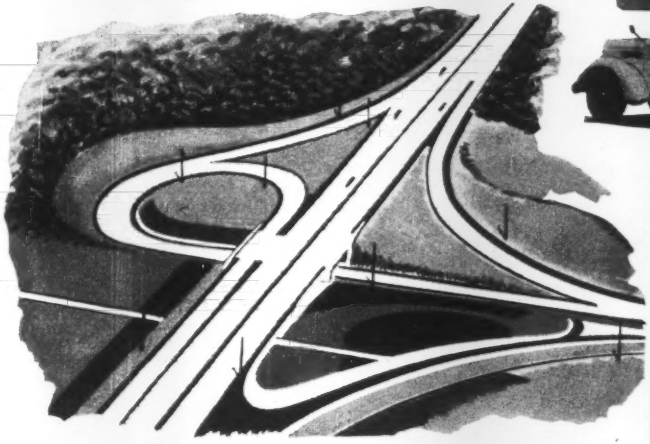
As one measure to provide additional capacity on the existing bay bridge, the report suggests that alterations to the lower deck offer attractive possibilities. (5.) That piece-meal solutions for San Francisco Bay Area problems should no longer be considered.

A master plan should be established and carried out. The engineers recommend that a governmental organization be established with funds and authority to administer and control future development according to a master plan.

17 GRADALLS

help build new extensions to Pennsylvania Turnpike





The Pennsylvania Turnpike is known today as the greatest all-weather, non-stop superhighway in the nation. When both the western and eastern extensions are completed, Pennsylvania will have a 327-mile limited access highway extending completely across the state and linking the entire Eastern Seaboard with the Midwest.

THESE WELL-KNOWN CONTRACTORS ARE USING GRADALLS ON BOTH EXTENSIONS

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Ralph Myers Contracting Company
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Frank Patterson Construction Company
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L. G. DeFelice and Son, Incorporated
Rochester, Pennsylvania

Frank Mashuda Company
Portersville, Pennsylvania

James D. Morrisey Company
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James J. Skelly Construction Company
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C. J. Langenfelder and Son
Baltimore, Maryland

E. P. McHugh Construction Co. (2 Machines)
Penndel, Pennsylvania

C. W. Good Construction Company
Reading, Pennsylvania

S. J. Groves and Sons Company
New Milford, Pennsylvania

THERE's little wonder that so many Gradalls were used on this famous highway project. The Multi-Purpose Gradall Construction Machine handles more types of construction work—more simply—than any similar machine on the market!

The contractors who used the Gradall knew that whether it's trenching, excavating, ditch digging, grading, or pavement removal, the Gradall handles the job simply and speedily, virtually eliminating hand labor.

Ask for a demonstration to see how the Gradall can improve *your* operation. You can arrange this with your Gradall Distributor.

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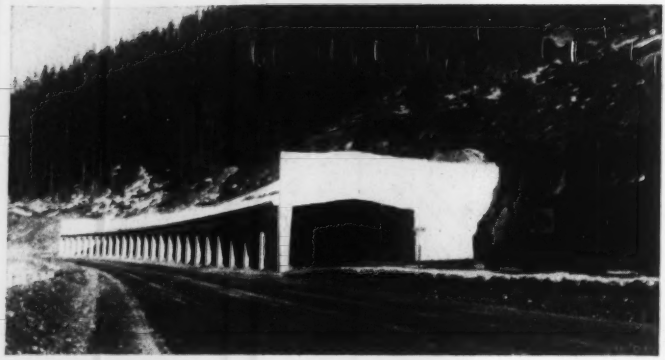


SNOWSHED FOR MOUNTAIN HIGHWAY—Aimed at preventing road blocks due to snow slides, this shed is part of $1,200,000 project on the Snoqualamie Pass in Washington. It may well be the first snowshed on a major highway.

INSIDE THE SNOWSHED, the simple interior design can be seen. Roof is made up of precast units 2½ ft wide and almost 40 ft long. Roadway width is 28 ft.

Reinforced concrete sheds to keep snow off highway

CONTRACTORS have rushed to completion two snowsheds that are intended to keep an important mountain highway in the state of Washington open to travel during winter months.

The sheds cover a total of only 1,800 ft of the Snoqualamie Pass Highway (U. S. No. 10), but they are located at spots where slides of snow, rock, brush, and other debris have caused the closing of the road from a few hours to several days at a time.

The reinforced-concrete sheds were decided upon after exhaustive studies of possible tunnel routes at somewhat lower elevations that would have avoided the snow hazard altogether. The sheds cover two lanes, providing a 28-ft clear roadway width. A construction feature was the use of precast concrete roof slabs mounted on cast-in place walls.

When and if heavy snowfalls do come they will be carefully watched during the winter season for information that may serve as a guide for designers of similar work planned for Snoqualamie Pass.

Yet to be completed in connection with these two sheds is paving of the roadway through them. This will be deferred until spring.

• **Important truck route**—The Cascade Mountains divide the state of Washington in two parts. The western section include the major commercial and industrial cities of Seattle, Tacoma, Everett, and Olympia; the eastern section is primarily agricultural.

Trans mountain traffic in all periods of the year is an important element in the economy of the state. And it is becoming increasingly important, with such large construction projects as Chief Joseph Dam, the Columbia Basin irrigation project, and additional facilities at the Atomic Energy Commission's Hanford Works—all located east of the Cascades with best access via Snoqualamie Pass.

The lowest highway crossing of the Cascades in Washington is this Snoqualamie Pass route, which reaches an elevation just over 3,000 ft. Total snowfall on this route during years of record has ranged from 216 in. in 1925-26 to 631 in. in 1948-49. Maximum depth on the ground at one time has been more than 200 in. Much greater snow depths have been recorded at other Cascade Mountain crossings.

Snow depth in itself would not be impossible to deal with were it not for slides that cover the highway with snow and debris up to depths of 20 ft. This has resulted in closing the highway as much as 464 hours during a winter season. Such closing ranges from only a few hours to as much as four days. Result is heavy losses to truckers, bus companies, and businesses depending on transportation over the highway.

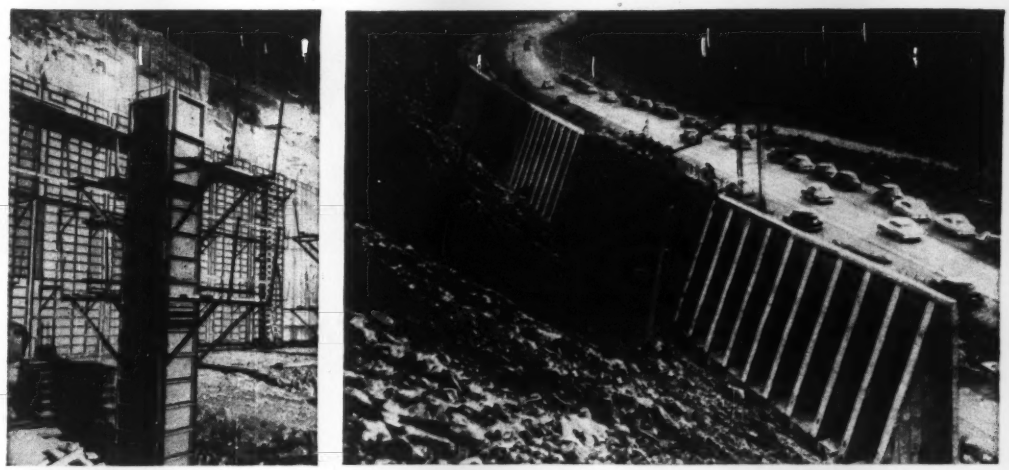
• **Tunnel studied first**—The snowshed scheme was adopted only after extensive studies were made of possible tunnel crossings of the Cascade summit. In 1946, Ole Singstad, New York consulting engineer, made a survey of the area and recommended a two-mile-long tunnel with the highest portal at el 2330 ft. Under 1946 prices, Singstad estimated cost of the project at $21,000,000, of which $17,000,000 could be financed by tolls.

State officials, after comparing the proposed tunnel project with a system of snowsheds, adopted the latter as being less expensive and achieving the same end result—that of keeping the highway open.

Ultimately it is planned to construct 6,000 ft of snowsheds, which in 1949 were estimated to cost $5,750,000. The first 1,800 ft of snowsheds was built for $1,200,000.

• **Road widened first**—First step in the construction was widening of the existing two-lane highway to a four-lane section. This permitted continuation of traffic on the outer two lanes while construction was under way on the inner two lanes. During summer months this part of the highway will be operated as a four-lane highway, two lanes inside the sheds and two lanes outside. Traffic flow will be speeded since the snowsheds are near the top of the grade and truck traffic on a two-lane roadway would slow the faster moving auto traffic.

During winter months, when slides



FORM WORK for the cast-in-place portions was simplified by use of sectionalized plywood forms backed up by light gage steel members. High tower of a mobile concrete mixer poured 28¼-ft-high up-hill retaining wall.

threaten, traffic will be restricted to two lanes. This will not have too great an adverse effect on traffic flow since there is a lower volume in the winter time and traffic normally proceeds at a slower rate.

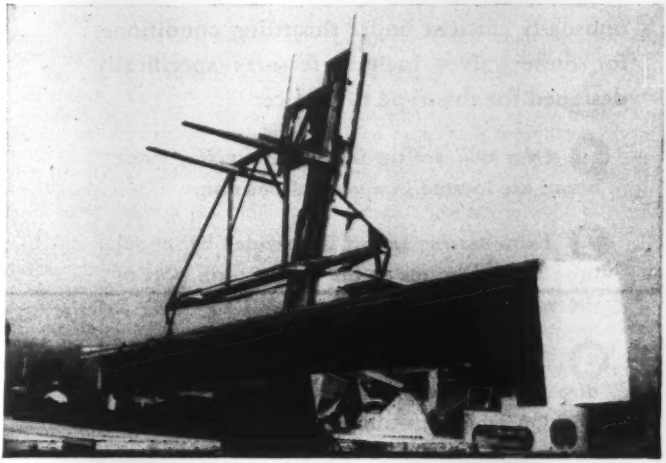
Completed in December were a 1,300-ft-long snowshed at Airplane Curve just west of the pass summit and a 500-ft shed at Lake Keechelus about 2 miles east of the summit. Both sheds have a vertical clearance of 15 ft and are 28 ft wide. Elevation of the Airplane Curve shed is 2,800 ft and of the Lake Keechelus shed is 2,600 ft.

The snowshed section slopes away from the hillside to encourage slides to pass over. The up-hill retaining wall is 28¼ ft high supported on 19-ft-wide footings. This wall is 1¼ ft thick and additional strength is provided by 2-ft-thick counterforts at 10-ft 2-in. centers.

The down-hill side has 20-ft open bays for the entire length of the sheds. Columns 2 ft square support concrete arches that in turn support the roof slabs. This open construction was included to afford visibility and ventilation. No fans or artificial lighting are included in the project.

• **Precast roof slabs**—Most interesting structural feature are precast concrete roof slab beams, not quite 40 ft long. These were attached to the cast-in-place walls by ¾-in. dowels that penetrate 2-in. openings in the precast beams. After erection of the slabs, the dowels were grouted in place.

The supporting structure was built in 100-ft sections. Thus, adjustment of the roof slab was possible at only 100-ft intervals. These close tolerances were met by precise casting of the roof slab units.



FORK LIFT TRUCK carried the 9-ton roof beam around casting yard by means of a specially designed lifting rig. Anchors screwed into the concrete replaced slings.

The roof slabs were cast in Seattle, 60 miles from the job. They are 2½ ft wide and each of the 720 units weighs 9 tons. These were stockpiled in Seattle and hauled to the job as needed. A crawler crane hoisted the slabs directly from the truck to the roof of the snowshed.

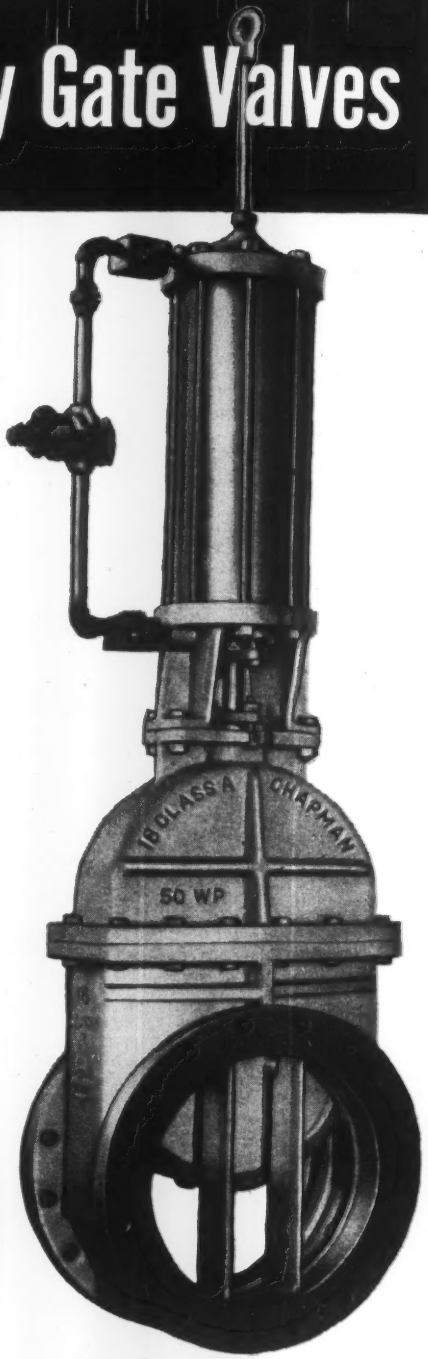
Forming the cast-in-place sections of the project was complicated by the close tolerances involved and by the fact that the alignment included both horizontal and vertical curves. The contractor adopted a system of form panels involving plywood facing backed up by lightweight steel framing. These could be easily assembled and were reused as many as 18 times on the main retaining walls alone.

Contractor on this work was C. V. Wilder Co. and Gaasland Co., Bellingham, Wash., with E. V. Shields as general superintendent.

The job was a special project of the state of Washington Highway Department, W. A. Bugge, director. Design was under the direction of George Stevens, bridge engineer. C. E. Chapman was resident engineer under the direction of T. P. Doyle, district engineer at Yakima.

CHAPMAN
Beamed Waterway Gate Valves
give better service for

Throttling Conditions



Chapman Beamed Waterway Gate Valves are unusually efficient under throttling conditions, for these valves include features specifically designed for this type of service:

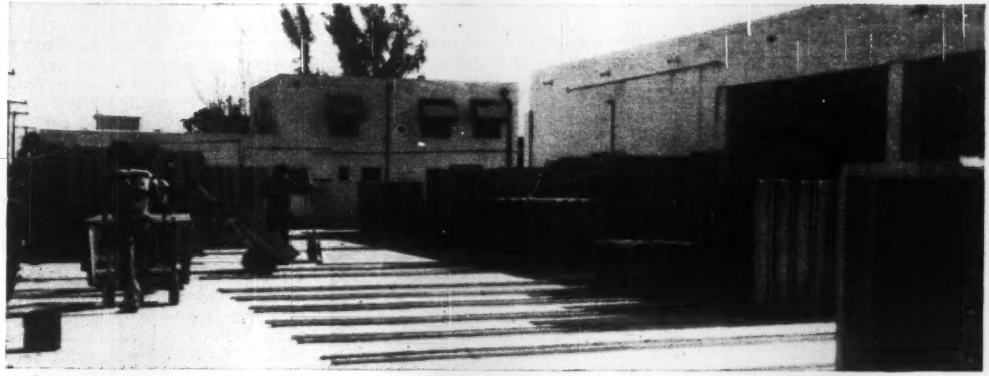
1. *Discs will not* tip into the waterway since beams are located in a vertical position.

2. *Extra bearing contact* is provided by special bronze-faced beams in the downstream port of the valve body.

3. *No uneven wear of seat rings* because the downstream disc is held securely in its relative position when throttling the flow through the valve.

Chapman Beamed Waterway Gate Valves have stood the test of time, giving years of efficient service under severest conditions in large filtration plants.

The Chapman Valve Manufacturing Company
INDIAN ORCHARD, MASSACHUSETTS



PRECAST WINDOW FRAMES are moved from the stacking floor to the storage platform on rubber-tired hand trucks. Exceptions are the very large frames, which are carried out by hand.

Precasting concrete window frames

PRECAST CONCRETE FRAMES for windows and doors are rapidly supplanting wooden frames in southern Florida, where the exterior walls in nearly all types of structures—ranging from small homes to office buildings—are built of concrete blocks.

Precasting of such frames, begun experimentally over 10 years ago, now is on a production-line basis that has brought the cost of the concrete frames to below the cost of conventional types of wood framing. During the peak of the past construction season the plant of the Livesay Window Co., Inc. in Miami, was turning out 14,000 units a month.

Wooden frame and the wood supports for steel or aluminum sash have many disadvantages in the Florida climate. It is difficult to keep the wooden sash and frames storm tight and they are subject to decay. The wood bucks that are used to support steel sash are even more subject to decay because they are cemented into the wall. Also, it is almost impossible to make the cast-in-place concrete sills of such windows water-tight, especially against rain driven by winds.

Concrete frames, on the other hand, are as permanent as the wall itself and can be made absolutely tight when the frames are cast to close tolerances.

One secret of the success of the frames cast in the Livesay plant is the precision casting, which includes accurate positioning of the metal sockets to receive the threaded bolts that secure the sash to the frames.

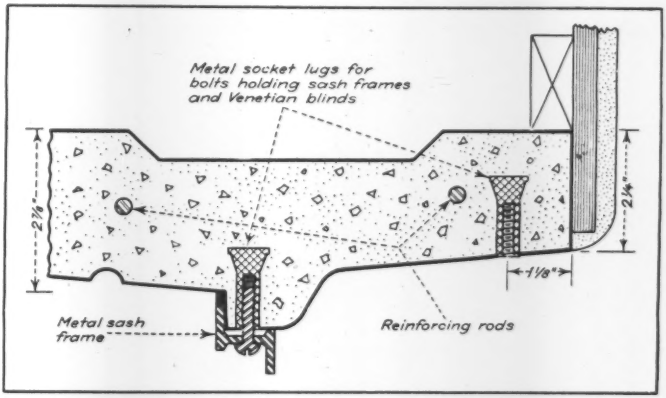
These frames are cast in a wide variety of standard opening sizes. Exterior edges are cast smooth for flush positioning in a block-faced-or brick wall, or are left rough to receive stucco in a stucco-faced wall. Recent developments include shadow-box effects.

Still more recent is a special frame for the now popular glass jalousie, a shutter-type window with narrow movable leaves of plate glass. These frames are designed to support the operating mechanism for rotating the glass leaves, thus reducing the amount of aluminum that otherwise would have been required for the frame. (This frame is being perfected to minimize the effect of the growing scarcity of aluminum.)

Sockets to receive bolts to hold venetian blinds are cast into the top stringer of most frames.

• **Accurate Casting**—All frames are cast in forms made of heavy pressed steel that are carefully machined for accurate fit of the sash and are braced to prevent distortion. Most of the forms are complete units with short legs to keep them high enough above the casting floor for the lifting arms of stacking trucks to slip under the form to move it around the casting plant. Very large frames, however, are cast in forms set directly on a flat casting floor set aside for that purpose.

Each frame is reinforced with two loops of small reinforcing rods or wire, ranging in size from No. 8 galvanized wire to ¼-in. bars, depending on the window size. The wire loops are placed in the forms by hand as the forms are being filled with concrete, but the rods that go in the larger forms are set before they are filled with concrete, being wired to



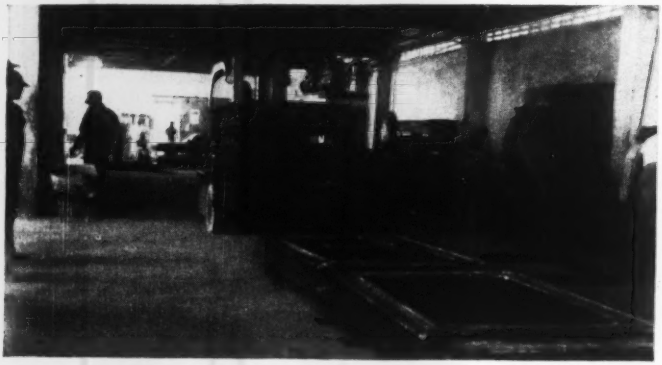
CROSS-SECTION OF THE HEAD of a typical precast frame showing the special sockets for bolts to hold sash frames and venetian blinds.

the socket lugs for the sash bolts.

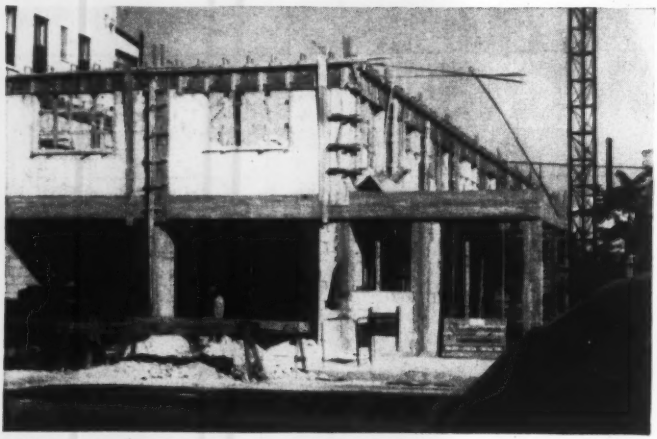
These socket lugs are accurately positioned by drilling holes slightly larger than the diameter of the sash bolt through the forms at the exact location for each bolt. Bolts are then inserted and threaded into socket lugs and turned up tight with a small power wrench, thus holding each socket tight against the form in its proper position. Before the forms are stripped, all bolts are withdrawn.

Socket lugs are of a non-corroding metal, made especially for this service by the Star Expansion Bolt Co. That company now is designing a new lug that will have a notch to hold the reinforcing rods used in the larger window frames. This will eliminate the work of wiring reinforcing rods to the lugs.

A STEEL FORM being filled with concrete by hand spouts from an overhead mixing plant. The forms are vibrated as they are filled.



A STACKING TRUCK (center) picking up three of the filled forms for movement to one of the steam curing rooms.



WINDOW FRAMES of precast concrete, braced to prevent distortion, were set in the wall of this building.

• **Production-line movement**—Forms are cleaned and assembled at one end of a large casting floor in the Livesay plant. When the socket lugs have been bolted in place, stacking trucks move the forms part way down the floor to be oiled. Oiling is done with a spray gun, after which the forms are stacked near the concrete spouts. From these stacks individual forms are picked up by other stacking trucks and advanced to the concrete spouts where each is filled while on the arms of the stacker.

When frame forms are filled and struck off, the stacker serving the concrete gang starts the forms back down the floor toward the steam curing room.

Stackers that started the empty forms down the concreting floor next pick up filled forms and stack them in one of the curing rooms. As a room is filled, it is closed and live steam is turned on for 1½ hr. At the end of that time, the filled forms are brought out onto the floor again, stripped from the frames, cleaned and started on their way down the casting floor again.

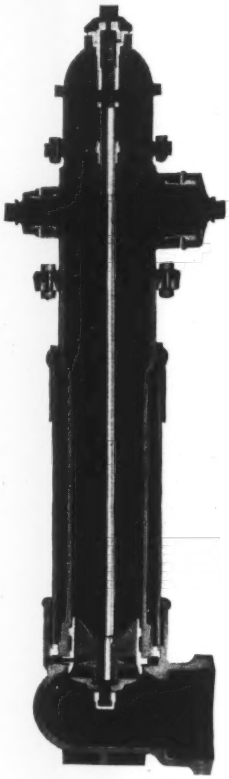
Rubber-tired baggage trucks are used to move most of the steam-cured concrete frames out onto the storage platform. Very large ones are carried out by hand.

Before being moved, wooden cross-braces are bolted into the larger frame to give added strength to the green concrete.

High-early-strength cement is used for the concrete, which is made with local sand and limestone aggregate. A strength of 5,600 lb., at 28 days is specified. Forms are vibrated to consolidate the concrete.

The Livesay company does not supply the steel or aluminum sash for its frame, but it does have its own men install the sash to insure a correct fit.

Frames for the popular corner windows are cast in two sections. Support at the corner is supplied by a 4-in. pipe column inserted at the time the frame is set and concreted into place. A 4-in. square metal column is used for corner support in the larger windows.



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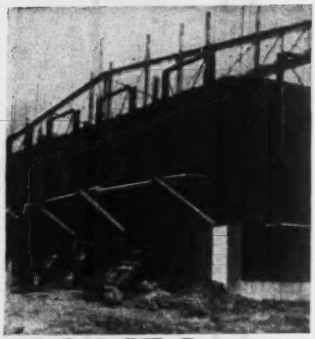

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READER COMMENT

More on Turin "Palace"

Sir: The roofs made of precast concrete units described in ENR Jan. 4, p 46, belong to the most spectacular and ingenious structures ever built. Let me add some details received from Italy and especially emphasize some fundamental ideas of the engineer, Prof. Pier Luigi Nervi, and circumstances under which this beautiful Exhibition Palace was built:

(1) This construction was possible because of the progressiveness of the owner's representative, engineer Derossi. Says professor Nervi: "Every designer knows from his experience how many projects (and perhaps the best solutions) remain on the drawing and dead because of restricted ideology, greediness and jealousy of those who have to decide about the final approval of the design."

(2) The marvelous construction resulted from a free competition on the basis of design submitted by the successful contractor, engineering corporation Nervi & Bartoli. General layout was made by Roberto Biscaretti.

(3) The design adds esthetic expressiveness to the structural features confirming once again the necessity to coordinate unseparably structural design with architectural characteristics.

(4) This structure shows clearly the fact that this kind of building, designed on principles that are delicate and not traditional, could not be materialized without able and progressive executive organism.

(5) Each individual precast unit of the roof structure in Hall B (8 x 15 ft) weighs 3,300 lb. Thirty such units were installed in a day, and the completion of the roof required 20 working days.

(6) The half-dome rests on columns along the perimeter and is stiffened at the springing by a semicircular horizontal roof 33 ft wide. Two methods of structural analysis were used: the method of parallel strips arching over decreasing spans, and the exact method of Professor Dischinger based upon isostatic stress curves.

(7) The semi-spherical dome consists of circular intersecting beams forming a lattice work, which supports precast slab units only 1¼ in. thick. Average thickness of dome shell, including ribs, is 3¼ in., which is the thickness of the glass-concrete dome in Paris designed by the writer in 1937.

(8) The precast roof units don't require any roofing or waterproofing.

(9) Deflection of the 275-ft. roof after removal of scaffold was ¾ in.

(10) The main floor of the building was designed for a 205-psf live load and consists of precast units.

J. J. Polivka
Consulting Engineer
Berkeley, Calif.

Cellular cofferdams

Sir: I have noticed lately numerous articles, in the various engineering publications, relative to the adoption of the typical steel sheet pile cellular cofferdam construction to the use for ship berth, wharf or pier construction. Almost without exception do these articles refer to this use of cellular construction as an innovation in pier construction and would lead a reader to believe that its use is far less costly than the standard construction of reinforced concrete or framed steel, and that the idea is something entirely new.

In 1930 the predecessor to this Corporation, Doullut and Ewin, used a modified form of cellular construction for a pier at Panama City, Florida. Again during World War II, this same corporation adopted the truly cellular construction to its design for a pier at the Alabama Dry Dock & Shipbuilding Company in Mobile, Ala. over which heavy equipment was required to travel and against which a large floating dry dock was moored.

Again, in 1946, when the present Ewin Engineering Corporation was engaged by the Alabama State Docks and Terminals to make an engineering plan for future expansion of their ship berthing facilities at Mobile, Ala., among the several types of design considered for the several marginal wharves of the new berths, the cellular steel sheet pile construction was considered. This type was not adopted for the final design as it was found to be more expensive than an all concrete wharf supported on reinforced concrete piling and supplied with a light steel sheet pile cut-off wall along the inshore edge.

As you may see, we have for many years considered the steel sheet pile cellular type of construction for our pier and wharf design. However, unless there is some special load, or other requirement which would dictate this type of construction over the concrete pile supported, flat slab deck wharf, we have never been able to justify its higher cost in adapting it to the project.

Truman A. Smith
President Ewin Engineering Corp.
Mobile, Ala.

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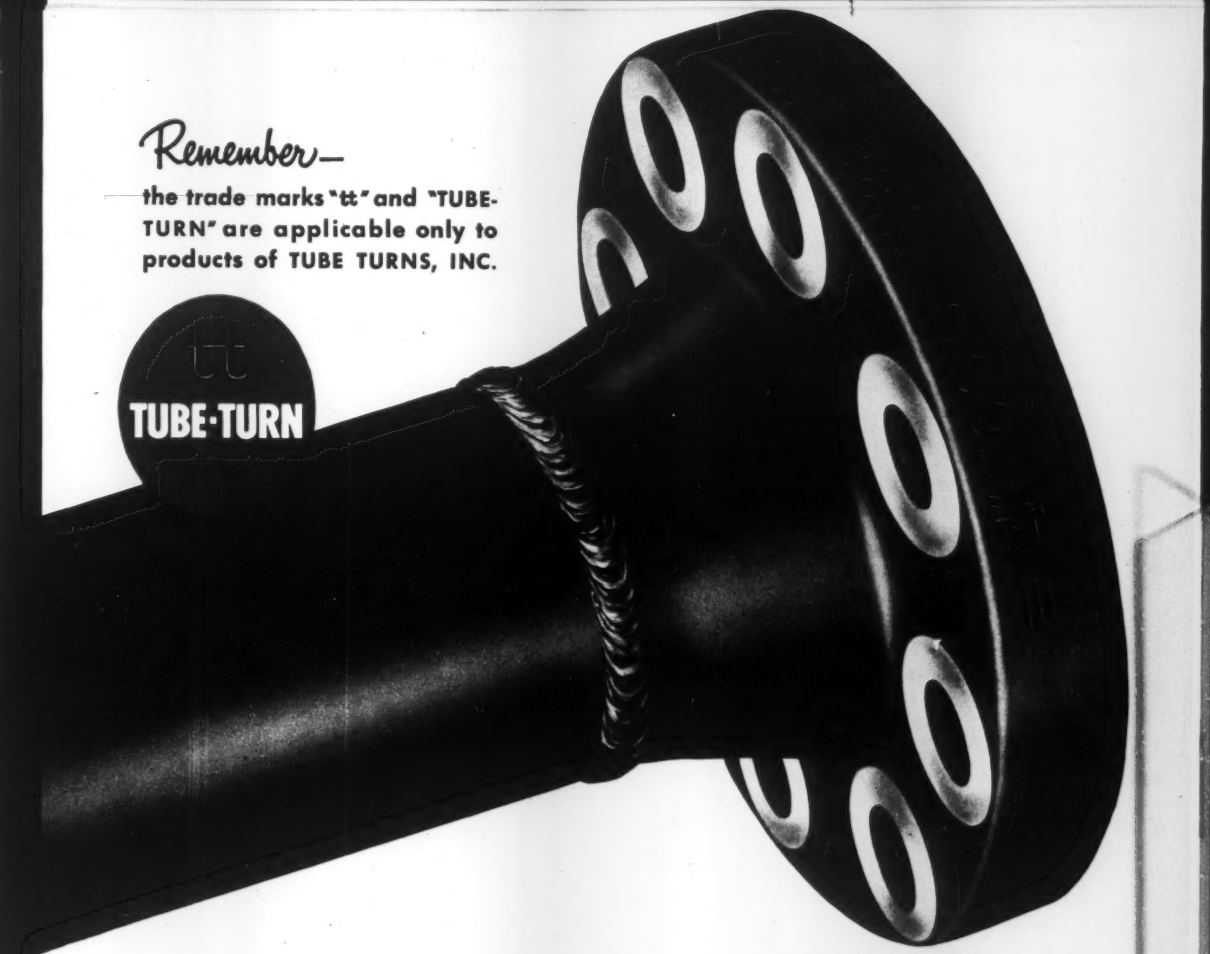

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Welded wrought-iron lines serve new Hospital Buildings

Underground tunnels at Cleveland's City Hospital contain the old and the new in piping. New 125-pound steam main (Fig. 1) serving several new buildings is welded. A welded system with TUBE-TURN Fittings was chosen to cut installation time, and to get tight, leakproof joints.

New welded line (Fig. 2) elbows neatly over an older pipe. When space is confined like this, welding is the answer. Contractor welded pipe from 2" up to 12" in tunnels, boiler room and power house.

With welding equipment on the job it's easier to put up pipe supports too. Eyebolt (Fig. 3) is quickly welded to TUBE-TURN Elbow, support rod hooked through it. This steam line to the water heaters must be secure.

Insulation on the maze of piping to the boiler feed pumps (Fig. 4) went up fast, with no flanges to work around. In such close quarters a neat design and reduced space requirements are especially important. And with the pipe welded to TUBE-TURN Fittings, joints won't leak, and insulation will last.

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Fig. 1. Welded underground steam main.

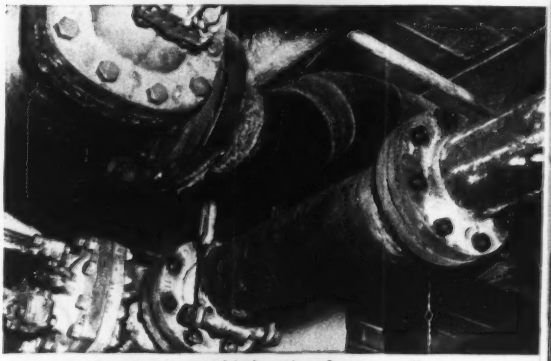

Fig. 2. New welded piping fits in small space.

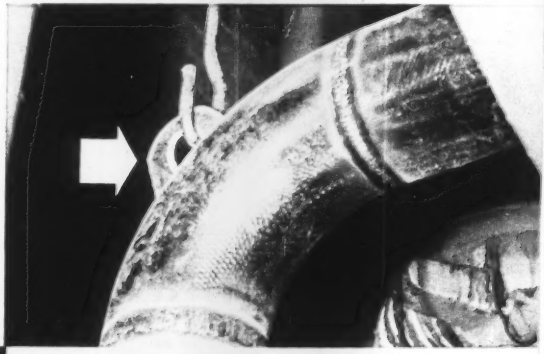

Fig. 3. Support on steam line elbow.

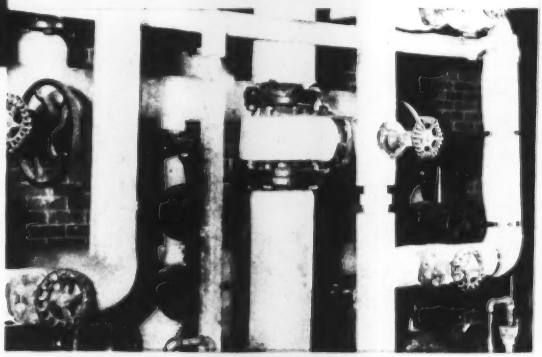

Fig. 4. Insulated welded piping.

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NATURAL ROCK was unavailable, so contractor imitates nature, as . . .

Bear grotto is constructed of concrete

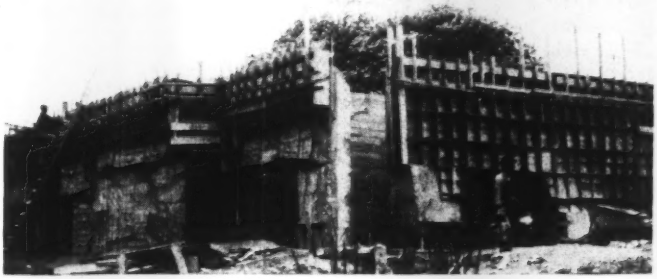
Most bear grottos are constructed on a hillside with the dens dug back into the hill. However, because Seattle's Woodland Park doesn't have such a hill, the parks department decided on a circular type of construction, with the dens in the interior of the circle.

A natural-looking grotto was desired with dens having the appearance of true rock. W. C. Hall, parks engineer, together with Fiksdal & Ness, contractors, worked out an interesting solution that resulted in a natural-appearing surrounding for the bears.

As a first step in preparing forms with the irregular contours of natural rock, a complete scale model of the project was built showing the shape of the rocks. Forms were then constructed from measurements taken off the model at 2-ft intervals. The forms were straight on the interior face. Each form was numbered to insure its placement in the proper location.

These forms (4,500 of them) were made from boxes 2 ft high and 32 in. wide. The irregular faces varied from 2 to 18 in. thick out from the 7½-in. wall.

After concrete was poured (2,700 yd), and forms stripped, the walls were gunited—some with a bare ½-in. layer; others built up by repeated applications to bring out the shape of the rocks. Stiff concrete mortar containing pigments was plastered into place by hand, giving the surface the appearance of weathered metallic streaks. The surface was wire brushed, after which crevices and cracks were cut with a small trowel. Construction cost was $250,000.



IRREGULAR ROCK-TYPE FACE required complex form work.

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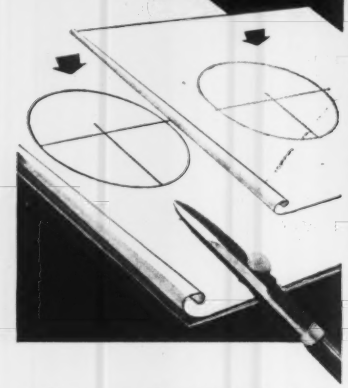

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MUNICIPAL AFFAIRS

SEEING CLEVELAND—Following are the landmarks of Cleveland as numbered on the aerial photograph above: 1—Cuyahoga River; 2—Superior High Level Bridge; 3—Superior Avenue; 4—N. Y. Central and Nickle Plate Ry. viaduct; 5—U. S. Post Office; 6—Hotel Cleveland; 7—Terminal Tower; 8—Higbee Department store; 9—Roof of Union Ry. Terminal; 10—Terminal Building group; 11—May Co. department store; 12—Williamson Bldg.; 13—Federal Building; 14—Public Square; and 15—Carnegie Ave. Bridge.—Photo, Aerial Surveys, Inc.

Cleveland rebuilds its rapid transit, spends millions on other projects

Cleveland, largest city in Ohio, with its population of 905,636 and with nearly that many more living in its immediate suburbs, promises to work out of a transportation mire it found itself in at the end of the last war. At the same time, the city is spending $22,000,000, borrowed from the R.F.C., to construct a rapid transit system, extending from the far east side to near the city's western limits over rights of way leased from the Nickel Plate and New York Central railroads.

Trolley cars have been replaced, either by electric trackless trolleys or gasoline or diesel-powered buses. There are local feeder lines generally operating north and south to the main east-west downtown lines, transferring passengers to express and limited buses.

While the mass transportation system is in the midst of a renovating and expansion program, new facilities are under way to make the lot of the private driver easier by continuing work on freeways, leading from the suburbs into the downtown area, or on main line east-west boulevards which connect to lead through the city by skirting the downtown business area.

Approximately $1,000,000 is to be spent over the next three years, one-third provided by the city and the balance by downtown merchants, to provide facilities for off-street parking. The merchants have been clamoring for this project since outlying shopping centers are making inroads on downtown stores sales.

To be completed by 1952, are additions to the city's water supply. Cleveland sells water to most of the 54 surrounding suburban municipalities. The load became too heavy for the two existing 150 mgd water mains three years ago. Now a third main is being added, plus another filtration plant and improvements which will equalize water pressure to all customers. The raw water is obtained through cribs located about 3½ miles out from shore in Lake Erie.

(*Continued on page 54*)

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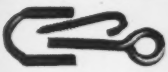

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MODEL 543

BUCKET LOADER . . .

SAVES man power-truck time-money

LOADS all free-flowing materials at 3 yrds. per minute

Cost studies prove that nothing can compete with a Bucket Loader in lowest cost loading from stock piles to trucks.

The B-G constant flow principle virtually eliminates the human element — guarantees the same hourly production all day long, whether the operator is fresh or tired out.

The new Barber-Greene Model 543 is the last word in loading economy. Backed by over a billion cubic yards handled by its predecessors, this machine is ready to cut your loading costs.

The new hydraulically controlled trimmer-conveyor combines with time-proved B-G advantages — such as the Spiral Feed, Cleanup Scraper, automatic Overload Release and Floating Boom — to save appreciable manpower on every job. With its 15 m.p.h. road speed, the 543 can get to the job fast and move from pile to pile in a hurry. It is built for high production through years of low-cost service. In addition, it is convertible to a Snow Loader for year-round usefulness.

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for lowest cost per yard-in-truck

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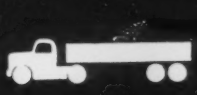
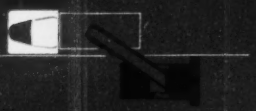
HYDRAULIC TRIMMER



NEW VERSATILITY



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Today, with manpower and truck time becoming more and more costly, the B-G 543 Loader offers you a proved way to save money while speeding up your loading operations. Use this coupon to get full information and start planning for the day when you'll have a Model 543 cutting your costs.

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Send bulletin on the 543 Loader. ☐

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Address .....

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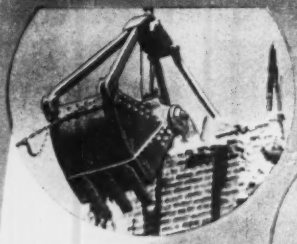
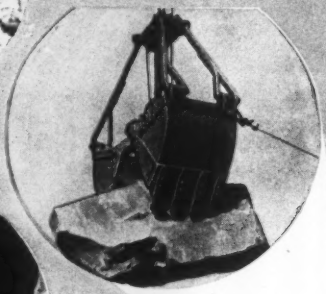
Truly Versatile..

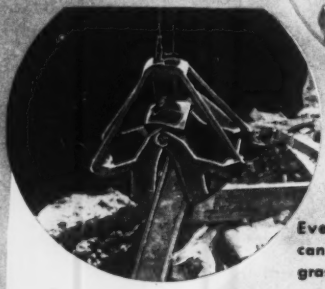
AN OWEN BUCKET



Rapid excavation in all types of soils with "A" Mouthful at Every Bite."



Owens "lend a hand" in tearing down as well as cleaning up on demolition jobs.



Tremendous closing power is graphically illustrated in this rock handling operation.

Even steel girders cannot escape the firm grasp of an "Owen."

More than just buckets, "Owens" are Versatile Tools, earning their way, every day on jobs of widely varying nature.

Sound principles of design and rugged construction are paying dividends to Owen owners everywhere. Write for the catalog.

Old tires by the dozens are handled with ease by versatile "Owens."

"A mouthful at every bite"

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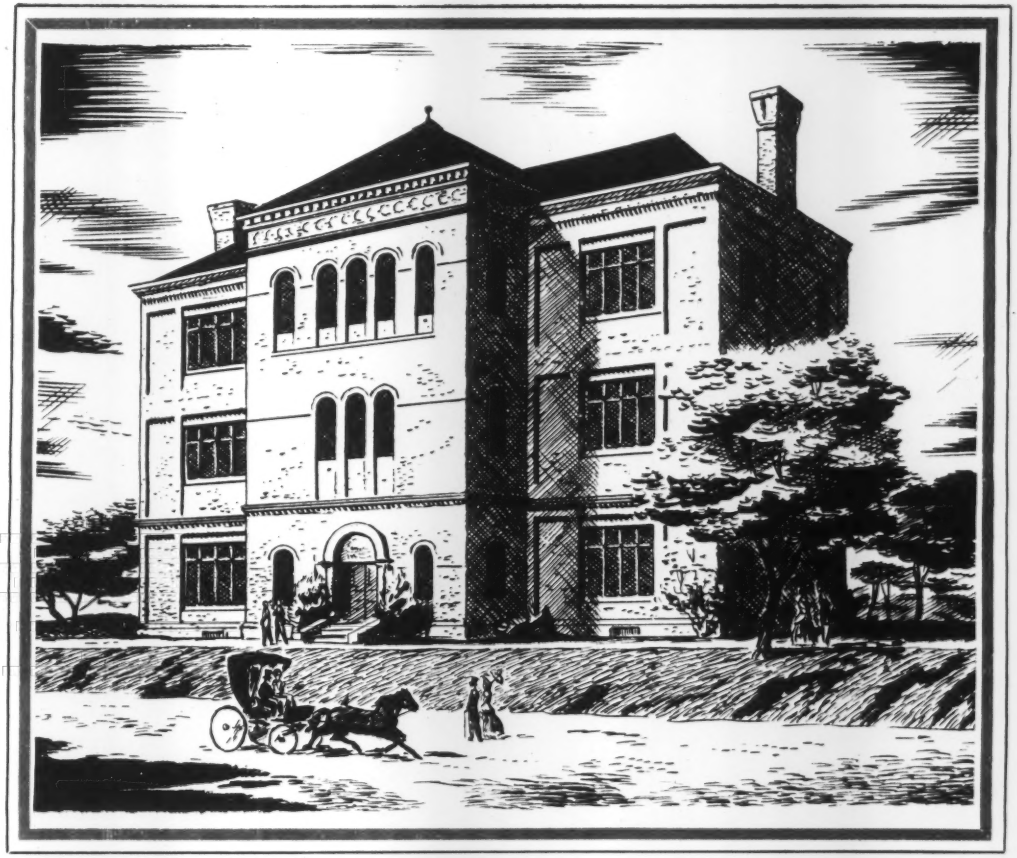
The largest tax-supported capital improvement program in the city's history has been announced for 1951. Approximately $10,650,000 in tax-supported bond money will be spent. Of that $2,800,000 will go for new sewers and about $1,300,000 for paving. Self supporting mortgage revenue bonds will provide $2,500,000 for new sewage disposal facilities, $900,000 will go for new construction work at City Hospital, $1,000,000 for cost of preparing plans for a new airport administration building, an additional runway and other improvements; $300,000 will go for city parks, $100,000 for harbor bulkheading on the lakefront; $450,000 will be spent on preparing plans for new police and fire department facilities, traffic signal systems and rehabilitation of existing police stations; while $150,000 will be spent for another incinerator soon.

Cleveland will also spend $1,600,000 as its share of the $6,400,000 cost of widening Lake Shore Boulevard, skirting Lake Erie east from the downtown section, and $500,000 will be expended for a bridge over Walworth Run, and $350,000 for repairs to City Hall.

Permits were issued for 15,120 dwellings in the Greater Cleveland area last year, as compared with 11,150 during 1949. The number to be built in 1951 is anybody's guess right now, depending more or less upon federal regulations. But most builders agree that the urgent demand for housing had been pretty well taken care of until the recently started heavy industrial expansion created the need for more homes for the new workers coming to Cleveland.

Industrial construction is at a high level, the principal jobs now in progress being the expansion program of Republic Steel, the new Ford Motor engine plant and foundry, large scale construction at the Lewis Laboratory of the National Advisory Committee for Aeronautics, new Lincoln Electric Co. plant, Euclid Road Machinery expansion, new construction at Thompson Products, and the reactivating of the bomber plant at the Cadillac Tank Plant. Many of these developments are tied in with the national defense program.

The city's new Urban Redevelopment Program is expected to go a long way toward halting the large exodus of Clevelanders to the suburbs. As part of that program, a new zoning ordinance and building code provides for larger lots and yards, especially for the multiple-unit housing structures. It also limits the number of families to a maximum of 75 per acre. If such desirable living conditions can be created in the city, workers won't need to move out.



Troy's Rensselaer Polytechnic Institute as it looked 100 years ago

Troy, New York, has a cast iron water main in service that was installed more than a century ago, not long after the founding of Rensselaer Polytechnic Institute, one of America's oldest schools of science. An engineer of that day, who could foresee the transition from horse-drawn vehicles to buses and ten-ton trucks, would have been bold indeed to predict a useful life of 100 years for a cast iron underground main. Yet that is the record of cast iron pipe in numerous cities in spite of the changes in a century, and the stresses imposed by modern conditions of traffic and congested underground services.

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2. Toncan Iron Corrugated Metal Pipe has the strength and *flexibility* to carry heavy loads . . . to stand up under vibration, settling fill and weather changes . . . without cracking or crumbling.

North, South, East, West—yes, even abroad—Toncan Iron Corrugated Metal Pipe *has proved* that it usually outlasts the road under which it is laid.

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The Defense Production Problem

To win out in the struggle for freedom into which the Russian Communists have plunged us we must do at least four things. We must:

1. Speedily carry through a program of defense production which, at its peak, is scheduled to take about one-fifth of our national output.

2. Pay for this program as we go, by methods that will enable us to maintain the effort for an indefinite period – as long as may be necessary to insure peace and security.

3. Manage intelligently and endure intelligently a set of direct government controls which, in certain critical departments, will put our national economy for a time in a hateful straight jacket.

4. See that these emergency controls are not fastened upon us permanently thereby presenting to our Soviet antagonists a major victory for collectivism on our home front.

This is the first of a series of editorials designed to present in the simplest terms these key aspects of our struggle to preserve our free institutions.

A Staggering Task

The magnitude of the defense production job staggers the imagination. Over the next year it calls for a larger volume of goods and services than the 20 million people of the states of New York and New Jersey will use for all purposes. The (London) TIMES has observed that, taken alone, the increase of defense expenditures which has been budgeted for the federal government's coming fiscal year (about $30 billion) "is in itself not far short of the total national income of the United Kingdom."

Yet so powerful is the production machine created by free American enterprise that, at the scheduled peak, the defense program will take only about one-fifth of our total national output. The exact form and dimensions of the program will, of course, be hammered out on the anvil of public and congressional debate. But the President's recent estimate of an annual rate of expenditure of $45-55 billion for defense by the end of this year may well turn out to be somewhere near right.

To meet even these vast requirements of defense production we are in better shape technically than we were when we started to prepare for World War II. Our industrial plant and equipment is greatly improved. Over $65 billion has been invested in it since V-J Day. Our working force is about eight million larger than it was ten years ago and much better trained.

The difficulty, and it is a very serious economic difficulty, is that we must fit the defense program into a productive machine that has been almost fully extended to meet the needs of a booming civilian demand. The present plan is to step up defense production during 1951 from about 7% to about 18% of our total national output. Because there is relatively little slack in our economy, this means that civilian production at the outset must

be cut back as defense production is stepped up.

The cut-back of civilian goods must be especially severe in the case of products made of metal. This is particularly true of goods that use scarce strategic metals such as aluminum and copper. Of our total defense production program, about half will go for "military hardware" – airplanes, guns, munitions, tanks and the machinery to make them. By the end of 1951 defense requirements are scheduled to absorb most of the metalworking production not required for essential construction and for the spare parts necessary to keep existing equipment running. For a time at least, there will be a sharp cut in the supply of new metal products available to civilian consumers. The defense squeeze on both materials and manpower will also cut sharply into housing and other civilian construction.

For the Short Run — Controls

In the short run there is no answer to the problem of meeting defense production schedules except controls. Sharp reduction of non-defense expenditures by government is essential and would help greatly. But the basic fact is that we cannot increase our total production fast enough to meet immediately both civilian and defense requirements.

Controls are needed, therefore, to switch resources from civilian to defense production, and at the same time prevent the combined demand for critical products from sending prices right through the roof. In the case of many scarce strategic metals such as nickel, copper and cobalt, the task of increasing output is especially difficult because our limited supplies are tucked away deep in the earth in many quarters of the globe.

For the longer pull – and that is what we must face – there is another answer to our defense production problem that is infinitely better than controls. And this time, in contrast to World War II, it is all-important that we get the right answer to our defense production problem for the longer pull and that we get it right now. In World War II we geared our economy to meet the requirements of a relatively short and decisive conflict. Now our leaders, however they may differ as to methods, are well agreed that, at best, "the conditions under which we labor may persist for ten, fifteen or twenty years." That is General Bradley's phrase.

For the Long Pull — More and Better Production

For this longer pull, the constructive answer to our problem of defense production is clearly more and more efficient production all along the line. It is true that overall we now have the most efficient industrial establishment in the world. But, even so, much of it is far short of attainable efficiency. Some plants using up-to-date equipment and methods are as much as six times more efficient than others in the same industry that are lagging in modernization.

Our Director of Mobilization, Charles E. Wilson, has clearly in mind this problem of increasing our industrial efficiency. The first step in his job, as he conceives it, is to get out an adequate supply of weapons to equip the army, navy, and air forces already mobilized or in process of organization by us and our allies. The second step is to make sure of our capacity to produce both "military hardware" to meet any increased requirements and the maximum possible volume of goods for civilian use.

In concentrating on more and more efficient production, Mr. Wilson is squarely on the beam. We can attain his objective – by sustained effort on the part of each one of us backed by up-to-date industrial methods and equipment.

If we do that, we can maintain indefinitely an adequate defense effort and at the same time enjoy a standard of living higher than any other in the world.

Additional production and more efficient production are our surest safeguards against our two most menacing enemies on the home front – the deadly inflation that can destroy our free economy, and the strangling government controls that can destroy our political freedom.

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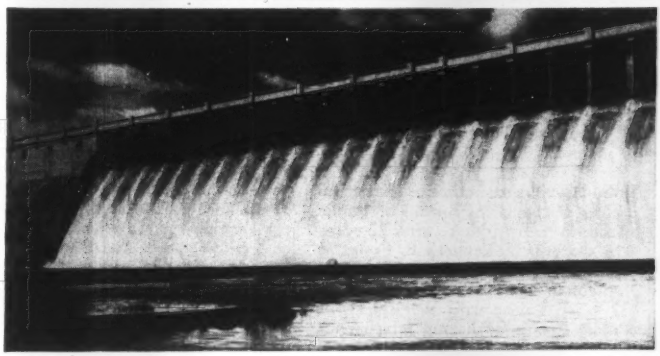
DEVELOPMENTS ABROAD



HUME DAM ON THE MURRAY RIVER, Australia, holds 1,250,000 ac ft of water for controlled release. It is to be enlarged to increase the storage to 2,000,000 ac ft. It is nine miles above Albury and 1,385 miles from the mouth of the river, which is Australia's greatest. More than 1,000,000 acres along the Murray are now under irrigation. Many thriving cities and towns owe their origin and development to the waters of that stream.—Eastern Publishers Service photo.

Big development projects planned for Australia

The Australian Ministry of National Development, headed by R. G. Casey, who was Australia's first minister to the United States, has outlined major developments for that commonwealth estimated to cost about $1.5 billion.

The survey is to act as a guide to the Immigration Planning Council in the allocation of immigrant manpower. About 200,000 displaced persons are to be taken to Australia annually to be employed for the first two years on government assigned jobs.

It is expected that the program will open up new national resources. At least, that is the professed aim of the impressive array of hydroelectric and other power projects, water conservation works, irrigation projects, land settlement schemes, coal-production plans and road building programs outlined in the schedule.

Sanitary engineers' group meets at The Hague

Attended by representatives of 16 European countries, the first seminar of European sanitary engineers was held recently at The Hague. The meeting was sponsored by the World Health Organization in cooperation with the International Health Division of the Rockefeller Foundation and the government of the Netherlands.

Some of the conclusions reached were:

In all countries the improvement of environmental conditions is essential for well being and productivity. There is need to develop an awareness of the economic and social values of sanitary works and of the necessity for providing adequate financing.

Engineering techniques and personnel are increasingly important in the control of environment. Governments in their public health organization should make adequate provision for the utilization of engineering sciences and trained professional workers.

Foreign Briefs

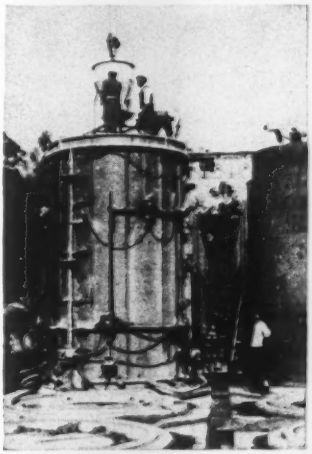
New ECA slogan—Hereafter, the slogan "Strength for the Free World—From the United States of America" will appear on the ECA emblem which marks American-financed shipments to Europe and Southeast Asia. ECA Administrator Wm. C. Foster said that the Marshall Plan concept of self help and mutual aid will be carried forward in the new program to hold back communism.

Peruvian zinc refinery—The Export-Import Bank of Washington has signed a credit agreement with the Cerro de Pasco Copper Corp. of N. Y. City, under which advances up to $20,800,000 can be drawn. These funds, together with a $9,000,000 investment by the corporation, will be used to construct on the company's properties near La Oroya, Peru, a refinery to produce up to 200 tons of refined zinc daily.

India reclaiming land—Nearly 80,000 acres of land have already been reclaimed during the current year by the Indian Government's Central Tractor Organization, bringing the total acreage since 1948 to over 183,300. For this work 180 new tractors, bought against a $10,000,000 loan from the World Bank, have arrived and 60 more are due in the next year. Reclamation objectives are 300,000 acres in 1951; 400,000 acres in 1952; and approximately 568,000 acres per year during the period 1953-1956. Reclamation of the three million acres will make possible an additional food grain production of one million tons a year.

For Formosan railroads—Weighing up to 66 tons each, 89 steel railroad bridge spans are being shipped from Japan to Formosa as part of a United States aid project in reconstruction of the island's railroad system, the Economic Cooperation Administration has announced. Rehabilitation of the 186-mile Formosan rail system, vital to the development of the economy of that island bastion of the Chinese Nationalist government, stands high on the list of American aid projects ECA has under way in the Pacific area at the present time.

Pakistan paper mill—Construction has started on a paper mill in East Pakistan to have an annual capacity of 30,000 tons of high quality paper. The location is on the banks of the Karnafulli River at Chandragona.



VACUUM-PROCESSED PENSTOCK—In the construction of a prestressed-concrete penstock for a hydroelectric project near Mucone, Italy, pipe 10 ft in inside diameter was precast in sections 16 ft 6 in. long. Immediately after the concrete was placed in the forms, excess water was drawn from it by vacuum, thus enabling the forms to be removed within a half hour. Forms were re-used 10 to 12 times a day.—Vacuum Concrete, Inc. photo.

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Troughing and Return Idlers for belts from 14" to 60".

Scraper Flight Conveyors—also steel or wood Apron types.

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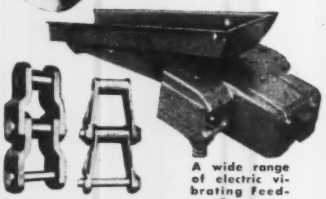
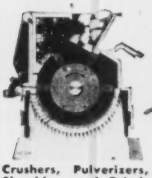


Chains, Sprockets and Attachments.

A wide range of electric vibrating Feeders, Conveyors, Packers, Screens, Check Valves, etc.



Crushers, Pulverizers, Shredders and Grinders.

Electric Vibrating Barrel Packers and Packing Tables with decks to provide conveying action.

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The Galion Iron Works & Mfg. Co., Galion, Ohio
The Kilbourne & Jacobs Mfg. Co., Columbus, O.

MEN AND JOBS

Lloyd W. Strayer, chief civil engineer of the Pittsburgh Limestone Co., has retired after 31 years. A 1908 graduate of Purdue University, he served the Erie, the Milwaukee and the B. & O. railroads before joining the limestone company in 1920.

John H. Ayers has retired as district engineer of the U. S. Bureau of Public Roads in Albany, N. Y., after 22 years. His successor is **Kenneth B. Foster** of the bureau's Albany office. Mr. Ayers' retirement marks the completion of 32 years' service with the Bureau of Public Roads, he having served with the bureau in Arkansas and Georgia before going to Albany. He was graduated from the University of Vermont in 1905, after which he was in engineering work in the Philippines for 13 years. His work with the insular service ended with his joining the Corps of Engineers in World War I.

Nicholas V. Back has been appointed maintenance of way engineer of the Toronto, Hamilton and Buffalo Railway, Hamilton, Ont., succeeding the late J. A. Harrison. He is a civil engineering graduate of Pennsylvania State College. Since 1938 he has been an assistant engineer with the New York Central Railroad, of which the Toronto, Hamilton and Buffalo Railway is an affiliate.

Edgar H. Beechley, for 18 years area engineer for the United States Army Corps of Engineers at Joliet, Ill., is retiring. He has been a government employee for 40 years, and in 1932 was assigned to Joliet to help in the construction of the Illinois waterway. He has been in charge of maintaining 115 miles of it since then.

N. W. Campbell has been appointed engineer for the Montreal district of the Canadian National Railways.

Former Building Commissioner Frank B. Rupe, Jr., of Elkhart, Ind., has been named assistant resident engineer for the city's $4,000,000 sewer and sewage treatment program.

R. M. Arenz of the Portland, Ore., division offices of the Bureau of Public Roads, has been named engineer in charge of highway planning and survey work for the bureau's district office at Missoula, Mont. He is a graduate of Oregon State College and has been with the Portland office for three years. He succeeds **J. F. English** in the Montana office.

Owen A. Gallagher, former chairman of the Boston, Mass., Street Commission, has been named as director of Boston's $40,000,000 slum clearance and urban redevelopment program.

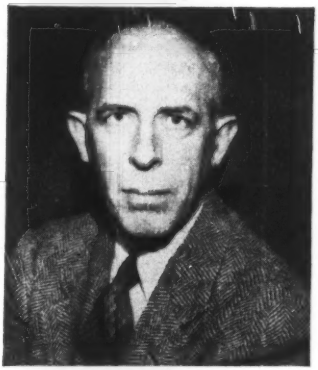
Guy Donald, senior district engineer for Los Angeles, has retired. He had been harbor district engineer at San Pedro since 1925. He first joined the city's employ as a draftsman in 1911. He is succeeded at San Pedro by **Carl Johnson,** who has been his assistant. The J. A. Jones Construction Co., Charlotte, N. C., has announced that **F. J. C. Dresser,** construction engineer, has been appointed manager of its offices at 50 Church Street, New York City, and 1737 DeSales Street, Washington, D. C. He studied civil engineering at the University of Wisconsin. He was in railroad construction work and was later employed by Turner Construction Co., the Austin Co., and other construction companies. In 1943 he was director of the War Production Board's construction division and later a member of the Construction Advisory Board of the War Department, and still later was a consulting engineer.

Paul C. Laux, formerly assistant superintendent of the Columbus, Ohio, division of water, has been named superintendent, succeeding the late Charles P. Hoover. **Marshall Houghn,** senior testing engineer in the water division, was named to succeed Laux.

Samuel B. Nelson is now assistant chief engineer of water works at Los Angeles. He is a graduate of Pomona College and took his engineering degree at Cornell University. He has been with the Los Angeles water department since 1925.

Howard R. Craig, Wapakometa, former deputy director of state highways at Sidney, has become chief engineer of the Ohio Highway Department bureau of construction. He has been with the department 20 years, and previously was Auglaize County engineer at Lima and also in the Lima city engineer's office.

H. M. Marshall, Okanogan County engineer at Okanogan, Wash., until a year ago, has opened offices as a consulting engineer in that city. A graduate in engineering from Cincinnati University, he previously has been with the DuPont Co., Northern Pacific Railway, Atomic Energy Commission, Bureau of Reclamation and the Navy.



W. Carman Davis has been appointed executive assistant to N. J. Highway Commissioner R. J. Abbott. He is an engineer and has had 27 years experience in the highway department.

Elected a vice-president of Thompson-Starrett Co., Inc., General Contractors & Builders with headquarters at 444 Madison Ave., New York 22, and branches at Boston; Chicago; Milwaukee; San Antonio, Texas; and Washington, D. C., is Leon P. O'Connor.

Paul Jarvis, contractor, and John Zoss, Bureau of Public Roads resident engineer, watch the development of Blue Creek Bay Bridge. These men are responsible for construction of this unusual structure across an arm of Coeur d'Alene Lake in northern Idaho.

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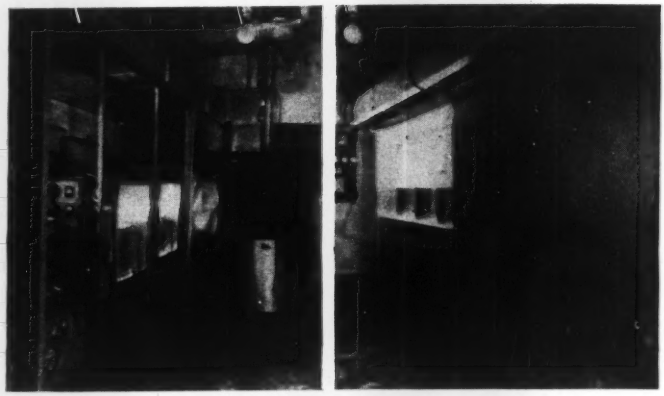

AN OVERALL VIEW of the National Bureau of Standards' new laboratory for accelerated durability testing of exterior coating materials. In the hood at the right are six weathering machines built at the Bureau and based on the enclosed carbon arc as a source of light. The hood on the left encloses four modified commercial weatherometers. The water-conditioning equipment is located above the machines on the right and the air conditioner in the center background. Automatic control of all functions and conditions within narrow limits will permit the NBS to obtain more reliable, accelerated weathering performance data on materials intended for outdoor use.

NBS studies durability of protective coating

A special laboratory has been designed and constructed by the Building Technology Division of the National Bureau of Standards to conduct accelerated durability testing of exterior covering materials such as asphalts, tars and paints.

Automatic control of all functions, and of the temperature and purity of the water within narrow limits assures uniform operation of the weathering labroatory.

Because at present accelerated durability testing of exterior coverings does not permit a quantitative correlation with actual weathering, the National Bureau of Standards has constructed a set of exposure decks on the roof of the laboratory that will hold 3,000 test panels. Materials are thus exposed concurrently on the roof and in the controlled laboratory. Data from these studies should provide some statistical correlation between outdoor weathering in the Washington, D. C., area and in accelerated durability testing in each of the several types of machines.

Scholarships and awards

Iowa State College—This college has accepted two $500 annual scholarships in engineering from the AGC of Iowa and the Iowa Master Builders.

Eschenbrenner Awards—M. T. Singleton, of Wiedman & Singleton, consulting engineers in Atlanta, Ga., will serve as judge of the Southern District in the 1951 "Eschenbrenner Awards" sponsored by Universal Concrete Pipe Co., Columbus, Ohio. Three awards in the amount of $500 each will be made to senior civil engineering students in colleges and universities east of the Mississippi River for the best papers on nonmonolithic concrete products. Next April 1 has been set as the deadline for entries.

Department of highways—The scholarship plan of the Kentucky Department of Highways will be continued for 1951-52. Before June 12 graduates of Kentucky high schools, class of 1951, will be selected as student engineering employees of the department by competitive examinations for enrollment as students in the college of engineering of the University of Kentucky. Students chosen will have the opportunity of working with the highway department until time to register and classify for freshman work in September, if not sooner drawn for military training.

Housing fellowship—Massachusetts Institute of Technology offers annually a Bemis Foundation fellowship of up to $2,500 to a student engaged in a program of graduate research in

housing. It is the purpose of these fellowships to encourage promising men from different fields to obtain advanced training and to enter the field of housing. Only students of exceptional scholastic promise will be accepted. Applications should be filed immediately with Burnham Kelly, director, Albert Farwell Bemis Foundation, M.I.T., Cambridge 39, Mass.

Student aid funds—The Virginia Road Builders Association has set up a Mahaffey Memorial Fund from which every year an outright grant of $100 is made to each of these institutions: Virginia Military Institute, Lexington; Virginia Polytechnic Institute, Blacksburg; and the University of Virginia, Charlottesville. Each of these will disburse the funds to worthy students in need of financial aid, through the student chapters of the American Society of Civil Engineers.

Tau Beta Pi fellowships—Full information concerning the $1200 fellowships for graduate study in engineering during the scholastic year 1951-52, to which members of Tau Peta Pi are eligible, may be obtained by writing to Paul H. Robbins, Director of Fellowships, 1121 Fifteenth St., N.W., Washington 5, D. C.

Architectural scholarship – This year's problem in the competition for the $2800 LeBrun traveling scholarship sponsored by the N. Y. Chapter of the American Institute of Architects is a "Motel" with possible conversion into a temporary shelter for evacuees and as a first aid station. Closing date for the submission of drawings is April 30 next. For details write to LeBrun Scholarship Committee, N. Y. Chapter, A.I.A., 115 E 40th St., N. Y. City.

American education must go on

"After Pearl Harbor, colleges and universities throughout the country suspended many of their functions and laid aside plans for new departures. This was justified by the nature of the situation which then confronted all American citizens. As I see it, no such justification is now at hand. To be sure, serious and painful readjustments will be required, and there will be the sacrifice of some aspects of education, which in a more peaceful world would be desirable, but there need be no hiatus in the forward movement of American education—at least that is my assumption about the immediate future of the universities."—President James B. Conant, Harvard University.

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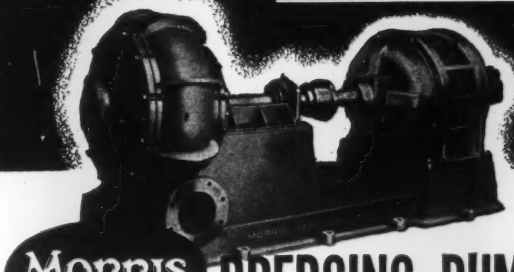

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MEETINGS

Ohio Contractors Association has elected C. P. Calaway, Toledo, president, R. O. Perrott, Jr., Lorain, was renamed vice-president, with C. E. McKee and Wayne T. Geissinger, both of Columbus, appointed executive secretary and labor relations counsel, respectively. Four trustees, named for three-year terms, were James A. Visintine, Columbus; Arthur S. Langenderfer, Toledo; W. E. Ringwald, Jr., Chillicothe, and R. O. Perrott, Jr. Other trustees are Harley E. Calvin, Marietta; Harry B. Fenton, Ashland; V. N. Holderman, Columbus; Paul F. Hollinger, Akron; Francis F. Smalley, Dayton; Henry J. Fauber, Ashland; C. P. Calaway, Toledo; and A. J. Baltes, Norwalk.

Edward Larson, Cincinnati, has been elected president of the Ohio Society of Professional Engineers. From 1940 to 1945, he served as executive secretary of the National Society of Professional Engineers.

Montgomery County Builders Association at Dayton, Ohio, has elected Melvin E. Kimmey president. Others elected were Anthony Wenzler, vice-president; Richard Rutmann, secretary; and Ralph Sharp, treasurer. Directors are Robert J. Haverstick, Gene Kreusch, Walter McCluskey, W. A. Simms, and Louis Zeiger. Curtis E. Miller was renamed executive secretary.

Frank R. Field of Esso Standard Oil Co. has been elected chairman of the executive committee of the Asphalt Institute, and Bernard E. Gray has been re-elected president. In addition to these two, the members of the executive committee are: Ingraham Grayson, L. P. Street, L. W. Walker, C. E. Cox, R. O. Wilson, and W. G. Julier.

More than 300 engineers, contractors and state officials from Colorado, Wyoming and New Mexico attended the University of Colorado's recent annual highway engineering conference. Three officers of the Colorado Contractors Association debated the merits of production and surfacing systems in use in Colorado and elsewhere with state materials engineers from three states. Morris E. Adelstein, president of the Colorado Contractors Association, Dan G. Bells, vice-president, and Carroll Brown, chairman of an association committee, were contractors on the panel. Materials engineers were M. A. VerBrugge of Wyoming, A. H. Bunte of Colorado and E. B. Bail of New Mexico. Burton G. Dwyre, New Mexico state highway engineer, sent a paper on "Truck Damage to Our Highways". John M. Adamson, materials engineer, district No. 1. Colorado State Highway Department, presented a paper on long-wearing but more expensive hot plant bituminous surfaces now being tested by the Colorado State Highway Department.

Sanitary engineers in the San Francisco Bay area have organized a group under the local section of ASCE and plan meetings every other month for the exchange of information. The group is called the Sanitary Subsection of the San Francisco Section, ASCE. Officers elected are: H. L. Thackwell, sanitary engineer, Kaiser Engineers, Oakland, chairman; H. B. Gotaas, vice-chairman; E. D. Thoits, secretary-treasurer; and J. S. Longwell and B. Benas directors.

Jean St. Jacques of Quebec City has been elected president of the Quebec Institute of Engineers of Canada. Other officers of the Institute include George Derners, vice-president and Roger Deo Gardino, secretary-treasurer.

CALENDAR

Structural Engineering Conference, University of Florida, Gainesville, Fla., March 16-17.

National Housing Policy Conference, Jefferson Hotel, St. Louis, Mo., March 19-20.

Illinois Section, A.W.W.A., LaSalle Hotel, Chicago, Ill., March 28-30.

N. Y. State Association of Highway Engineers, Rochester, N. Y., March 28-30.

Western Concrete Pipe Association, Hotel Fresno, Fresno, Calif., March 29-30.

New York Section, A.W.W.A., Hotel Ten Eyck, Albany, N. Y., April 5-6.

N. J. Society of Professional Engineers, Haddon Hall, Atlantic City, N. J., April 6-7.

Michigan Engineering Society, annual convention, University of Michigan Union, Ann Arbor, Mich., April 6-7.

Association of State Planning and Development Agencies, Sherry-Frontenac Hotel, Miami Beach, Fla., April 15-19.

Concrete Reinforcing Steel Institute, annual meeting, The Homestead, Hot Springs, Va., April 16-21.

American Society of Civil Engineers, Pacific Northwest Conference, Multnomah Hotel, Portland, Ore., April 27-28.

American Water Works Association, annual conference, Miami, Fla., April 29-May 4.

Materials Handling Exposition and Conference, International Amphitheater, Chicago, Ill., April 30-May 4.

California Sections American Society of Civil Engineers, The Ahwahee, Yosemite National Park, Calif., May 3-5.

Building Officials Conference of America, King Edward Hotel, Toronto, Ont., May 14-17.

Society for Experimental Stress Analysis, spring meeting, Wardman Park Hotel, Washington, D. C., May 16-18.

Pennsylvania Society of Professional Engineers, Americus Hotel, Allentown, Pa., May 18-19.

OBITUARY

William MacGorman, 105, a structural engineer and contractor, who worked till he was 91 years of age, died at Hopewell Hill, N. B., Feb. 22. He had lived all his long life in Albert County, N. B., except for about three years on the Pacific coast as a young man. He had specialized in the design and building of wharves, bridges and ships. His last job was as a district bridge superintendent for the Public Works Department of New Brunswick.

Fred M. Ashley, 62, Fresno, Calif., city commissioner of public works since 1941, died recently. He had been active in the California utility field for the last 30 years, having been with the California Water Service Co. as construction engineer for 14 years. He was appointed city building superintendent in 1939 and commissioner in 1941.

James R. Tidyman, 47, a civil engineer, Boston, Mass., died Feb. 23. He had been with the Cork Engineering & Insulation Co. He received his engineering degree at Tufts College in 1926. He also did graduate work at M.I.T.

Alfred H. Campion, 56, administrative chief of the Board of Supervisors of San Diego, Calif., died Feb. 17. He was also regional coordinator of the state civil defense organization.

Albert Angus Richardson, 59, engineer of the Ontario Hydro Electric Power Commission, died at Toronto Feb. 23. He built a number of the big projects of the commission, including the Des Joachims development of 480,000 hp which came into full production on the day he died. He had been general superintendent of the new Sir Adam Beck hydro development at Niagara Falls, Ont. Before going with the commission he was with the George Rayner Construction Co., Toronto, and the Morrow & Beatty Construction Co. which built the Chats Falls power development for the commission. Mr. Richardson was general superintendent for this power development while it was under construction.

Howard Wiswall III, 79, a civil engineer, died at Asheville, N. C., Feb. 20.

Elston A. Lotz, 60, a structural engineer on the staff of William B. Ittner, Inc., engineers, of St. Louis, Mo., died

(Continued on page 64)

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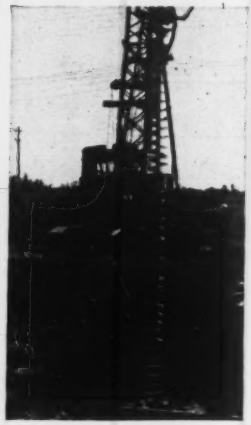

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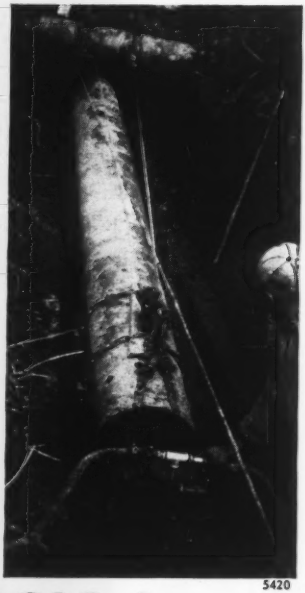

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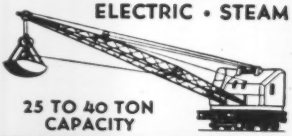

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Feb. 10 at Dexter, Mo., where he was supervising construction of a school building. At one time he was city manager of Brunswick, Ga., and was resident engineer of the U. S. Maritime Commission on its large scale shipbuilding program there in World War II.

Frank Holliday Derby, 65, died in Florence, Ala., Feb. 8. Born in Revere, Mass., he was graduated from the University of Maine. After serving as a first lieutenant in the United States Army in World War I, he went to the University of Washington in St. Louis to teach civil engineering until joining the organization of the Tennessee Valley Authority in 1941. He was associated with the TVA as a design engineer at Wilson Dam until his death.

Robert E. Thayer, 68, of White Plains, N. Y., was killed in an automobile accident on Feb. 25. He was a graduate of the Massachusetts Institute of Technology, 1907. He taught there for some time as an assistant professor and also at the Franklin Institute of Boston, Mass. He was vice-president of the Simmons-Boardman Publishing Corp., New York City.

William Henry Humes, 67, retired building contractor, formerly of St. Louis, Mo., died near Santa Monica, Calif. Feb. 21. He was president of H. B. Deal & Co., general contractors.

Col. Edward H. Schulz, 78, USA ret., died at Berkeley, Calif., March 3. He had been prominent in a number of government engineering projects throughout the United States and its possessions. He was also instrumental in the construction of the Golden Gate Bridge approaches through the Presidio, Fort Scott and Fort Baker military reservations. He was an 1895 graduate of West Point and was commissioned in the Engineer Corps. He was district engineer of Guantanamo, Cuba, in 1905. From 1907 to 1916 he was in charge of the improvement of the Missouri River. Later he supervised the Mississippi passes at New Orleans and he had other important engineering commissions. He retired in 1937.

Charles B. Clarke, 71, of Great Neck, N. Y., executive vice-president of Standard Dredging Corp. since 1933, died Feb. 16 in Bogota, Colombia, while there on business. He was born in England and came to the United States in 1902 and joined his late uncle, Charles Clarke, in the dredging business in Texas. Later he did dredging work in Latin American countries.

UNIT PRICES BID BY CONTRACTORS

Transmission line, S. D., Mo. River Basin Project

A transmission line for the South Dakota Transmission System, Missouri River Basin Project, drew 4 bids, all above the engineer's estimate of $602,706. The low bid, at $686,552.37, was 12% above this estimate and 5.6% below the second low bid. The bids, 7.9% apart, were opened Dec. 14, 1950 by the Bureau of Reclamation.

The line is approximately 84 miles long and is of the 115-kilovolt, 3-phase, 60 cycle, single-circuit, wood-pole, H-frame type. It will run from the site of the proposed substation at Huron, S. D., to the site of the proposed substation at Armour, S. D. The lines are designed for heavy loading conditions of ½ inch of ice and wind pressure of 8 pounds per square foot of 0° F.

The conductor for the lines will be 397,500-circular mil aluminum cable, steel reinforced. Two ⅜ inch, high-strength, steel-strand, overhead ground wires with a 30 degree lightning protective angle will be strung the entire length of the lines. Each pole of each structure will be provided with a ground wire.

Work must be completed in 240 calendar days with a penalty of $150 per day for each day's delay. Minimum wage rates are: skilled workers, $1.10; semi-skilled, $0.90; common, $0.75.

Bidders were:

1 Flora Construction Corp. & Flora Engineering Co., Denver, Colo. (Contract)	**$686,552.37**
2 Donovan Construction Co., St. Paul, Minn	**725,440.50**
4 J. & J. Construction Co., Oklahoma City, Okla	**741,097.98**
Engineer's estimate	**602,706.00**

Items	Quantity	Unit prices 1	Unit prices 2
Clearing land & right-of-way	ls	$6,000	$700.00
Constructing, Structure, typ-HS with 50' pole	ea	1 327.31	415.00
55' pole	ea	16 377.00	469.00
60' pole	ea	157 411.15	498.00
65' pole	ea	410 451.46	544.00
70' pole	ea	23 489.20	585.00
75' pole	ea	1 531.80	632.00
Typ-HA, 55' pole	ea	1 406.17	500.00
60' pole	ea	1 441.60	528.00
65' pole	ea	1 480.62	573.00
70' pole	ea	1 521.29	619.00
Typ-3A, 55' max pole length	ea	1 456.40	506.00
60'	ea	1 506.75	560.00
65'	ea	10 560.69	611.00
70'	ea	1 618.13	675.00
Typ-3AB, 55' mpl	ea	1 482.70	527.00
60'	ea	1 532.99	580.00
65'	ea	1 586.28	642.00
70'	ea	1 634.36	714.00
Typ-3AC, 55' mpl	ea	1 616.81	665.00
60'	ea	1 667.83	719.00
65'	ea	1 732.22	784.00
70'	ea	1 780.07	846.00
Typ-3AT, 55' mpl	ea	1 535.18	576.00
60'	ea	590.57	630.00
65'	ea	1 650.34	696.00
70'	ea	1 731.09	755.00
Typ-3T, 55' mpl	ea	1 627.01	687.00
60'	ea	1 682.41	741.00
65'	ea	2 742.17	806.00
70'	ea	2 822.93	879.00
Assemb & attach X-brace for 12' pole spacing	ea	549 $16.61	$41.00
For 14', 14' 6" pole spacing	ea	5 51.03	47.00
Construct single guy	ea	168 31.84	23.00
Double guy	ea	84 41.70	31.00
Stub guy with 50' pole	ea	1 157.43	140.00
55' pole	ea	1 167.71	165.00
60' pole	ea	1 190.67	179.00
65' pole	ea	1 258.27	200.00
Place plate or co anc	ea	249 16.39	15.00
Place grouted anchor	ea	3 18.29	14.00
Guy protector, i	ea	36 7.95	7.00
Assemb & attach suspension insulator assembly with 7 insul un	ea	1,806 34.47	31.50
8 insul units	ea	18 38.57	35.00
9 insul units	ea	57 42.48	38.50
A & A double suspension insulator assembly with 9 insul units per string & single yoke plate	ea	6 89.97	82.00
A & A tension-insulator assem with 9 insul un	ea	6 47.20	45.00
A & A double ten-insul assembly with 9 in un per string & double strain yoke	ea	24 96.79	89.00
String 3 397,500-circular mil ACSR conduct	mi	84 2,791.34	2,555
Attaching Vibrat damper to ACSR conduct	ea	42 9.70	10.00
50 lb hold-down wt for sus-insul	ea	3 13.90	25.00
100 lb	ea	3 25.52	38.00
180 lb	ea	3 18.95	56.00
String 2#" galvaniz st overhd ground wire	mi	84 513.39	730.00
Attach vibr damper to overhd grd wire	ea	24 4.88	7.00
Fence grd post & grd fences, place	ea	500 9.97	10.00

Flume, apron and grading for Kansas inlet canal

The Forestry, Fish & Game Commission of the State of Kansas received 3 bids, all below the engineer's estimated $22,168, on Jan. 19, 1951, for the construction of additional drainage facilities at the Cheyenne Bottoms Inlet Canal in Barton County, Kansas. The low bid was 23% below the estimate, 2% below the second low bid and 3.9% below high. Wilson & Co. of Salina, Kansas, were the engineers.

The job is located north of Great Bend, Kan., and is 5 miles from a railhead. It consists of excavation for and construction of concrete flumes and apron at the existing structure; grading tops of the spoil banks; grading and shaping existing berms and ramps; and excavating intercepting drainage ditch. Work will be started March 15 and must be completed by June 1. Wage rates to be paid are: common laborer, $1.00; semi-skilled, $1.50; skilled, $2.00.

Bidders included:

1 Thompson Construction Co., Ellinwood, Kan. (Contract)	$17,994
2 N. F. English Construction Co., Hutchinson, Kan	18,384
3 Western English Co., Harlan, Iowa	18,698
Engineer's estimate	22,168

Items	Quantity	Unit prices 1	Unit prices 2
Grad & ditching	lf 36,500	$0.05	$0.07
Backfl of existing flumes	lot 1	500.00	385.00
Structure conc	cy 70	90.00	60.00
Reinf steel	lb 5,500	0.14	0.12
Metal handrail	lf 48	5.00	4.50
Metal flume, 19"	lf 780	4.85	6.00
Flume, inlet & outlet	ea 27	160.00	200.00
Pipe culvert, 30"	ea 32	8.00	9.00

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- MATCHES COLOR OF CONCRETE FOR ARCHITECTURAL BEAUTY
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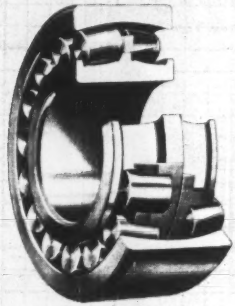

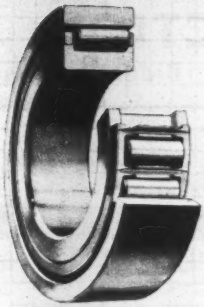

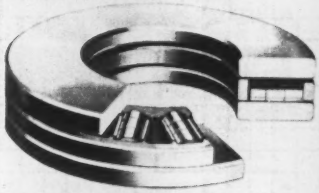

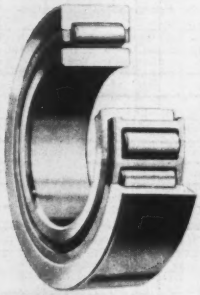

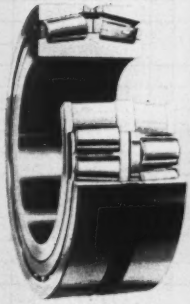

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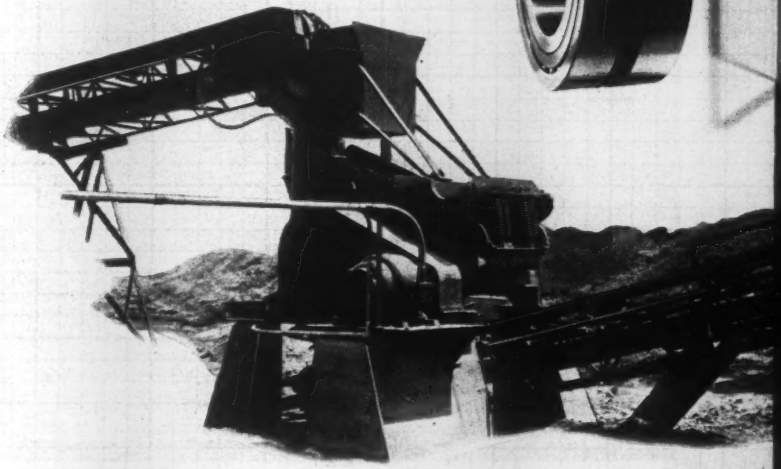

SPHERICAL ROLLER
TAPERED ROLLER
STRAIGHT ROLLER
NEEDLE
BALL
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BEARINGS

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager — **J. A. MAHONEY, Reports** — **M. R. ROESSLER, Statistics**

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

† Me., Long Island—PIERS—B.A. 3/21—Dist. Pub. Wks. Office, First Naval Dist., 495 Summer St., Boston, Mass.; repairs to Piers F and H at U. S. Naval Fuel Facility, Long Island, Casco Bay, Spec. 26102. Plans deposit $10.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ † W. H. Hinman, Inc., and Associated Pipe Line Corp., 58 Main St., Westbrook, Me. Low Bidder. $4,000,000. petroleum pipe line, MAINE, Dpt. Air Force. The Pentagon, Wash., D. C.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

† New York—B.A. 3/20—U. S. Eng., 24 St. and Maryland Ave., P. O. Box 1715, Baltimore 3, Md., wall rehabilitation, Chanango River adjacent to Front St. in Binghamton, approx. 520 lin. ft. T-type concrete flood wall; placement of riprap stone protection, approx. 560 lin. ft. of river bank, Broome Co., Serial No. CIVENG 18-020-51-11. CD 3/1.

LOW BIDDERS—BUILDINGS

▲ Earl L. Cump, Chambersburg, Pa. Low Bidder, $1,242,497, est. $1,100,000. general contr. two five unit type, and one double COTTAGE type bldgs. at Pennsylvania Soldiers Orphan Home, SCOTLAND, PA. General State Auth., 18 and Herr Sts., Harrisburg, Pa. Bids Feb. 28. Mitchell & Ritchey, 524 4th Ave., Pittsburgh, Pa., archts. A. F. Jones, c/o owner, ch. engr.

CONTRACTS—HEAVY CONSTRUCTION

▲ Tri-County Constructors, Elkins Park, Pa. Contract Awarded. $742,680, Contr. 1, structural steel for sewage disposal plant, READING, PA. Wyomissing, Pa. Joint Municipal Auth., West Reading, Pa. Bids Feb. 14. CD 2/21, under LB.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

† Mississippi—B.A. 3/28—Bureau Pub. Rds. Dpt. Commerce, First National Bank Bldg., Florence, Ala., Attala Co.—reln.-con. bridge under Mississippi State Hy. 35 and approaches, $.238 mi., Natchez Trace Parkway, Proj. 3M5. Plans deposit $10, H. J. Spelman, div. engr.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ State Hy. Dpt., Jackson, Miss. cancelled bids to have been opened Feb. 27, grading, drainage, culverts box bridge 2.108 mi. U. S. Hy. 80 between Chunky, Meehan Junction and Meridian, F. A. Project. FI 004-2 (3), F. A. Grade Crossing Proj. FGI 004-2 (5), Lauderdale Co., $215,000; grading 2.501 mi. U. S. Hy. 80 between Lake and Hickory through Newton, F. A. Project. FI 004-2 (4) F. A. Grade Crossing Proj. FGI 004-2 (6), Contr. 1, Newton Co. $135,000; grading, bridge, grav surf. 0.765 mi. Miss. Hy. 43 between Meeks Ferry and Sand Hill, F. A. Secondary Proj. S 143 (2), Madison and Rankin Counties, $125,000; grading, drainage, culverts, bridge, box bridge, grav. base, double bit. surf. tr. 8 in. uniform c. conc. 8.033 mi. U. S. Hy. 61 between Elizabeth and Washington-Bolivar Co. line, F. A. Proj. F 166 (4), Washington Co., $375,000; rejected bids Feb. 27, grading, drainage, culverts, bridge, box bridge 5.396 mi. Miss. Hy. 4 between Louisville and Kosciusko, F. A. Secondary Proj. S 138 (3), Winston Co., $203,000, MISSISSIPPI. CD 2/21.

CONTRACTS—HEAVY CONSTRUCTION

▲ Cobb Bros. Constr. Co., Inc., Citizens Bank Bldg., Meridian, Miss., Contract Awarded, $103,068, est. $95,000, grading, drainage, culverts, box bridge 4.598 mi. of Miss. Hy. 20 between Georgetown and Pinola, F. A. Proj. F 013-2 (3), Simpson Co.; $166,956 est. $145,000, grading, drainage culverts, double bit. surf. tr. 6.534 mi. of Miss. Hy. 49 between Liberty and Berwick, F. A. Proj. F 344 (3), Amite Co. ***J. B. Michael & Co., Inc., 1021 Heywood St., Memphis, Tenn., $233,426, est. $173,000, incidental grading, drainage, soil cement base, double bit. surf. tr. 10.854 mi. Miss. Hy. 1 between Petshiro and Sherard, F. A. Proj. F 043-2 (2), Bolivar Co.***John H. Moon, Port Gibson, Miss. $253,227, est. $320,000. grading, drainage, culverts, box bridge on 12.736 mi. Miss Hy. between Georgetown and Hazlehurst, F. A. Proj. F 013-2 (1), Copiah Co. ***Jerry G. Alexander Co., Hattiesburg, Miss. $173,349, est. $145,000, grading, drainage, stab. base double bit. surf. tr. 8.948 mi. Miss. Hy. 1 between Hampton and Longwood, F. A. Proj. F 395 (2), Washington Co., MISSISSIPPI, State Hy. Comn., Jackson, Miss. Grand Total $1,029,026. Awarded Feb. 27. CD 2/21.

CONTRACTS—BUILDINGS

▲ Blaw-Knox Constr. Co., Farmers Ban Bldg., Pittsburgh, Pa., Contract Awarded, $10,000,000, PLANT, MCINTOSH, ALA. Mathieson Alabama Chemical Corp., subsidiary of Mathieson Chemical Corp., 610S. Sharp St., Baltimore, Md.

MIDDLE WEST

LOW BIDDERS—HEAVY CONSTRUCTION

Thomas M. Madden Co., 4612 W. Van Buren St., Chicago, Ill., Low Bidder. $201,916, extension channel imprvt. work in Addison Creek, Cook Co., ILLINOIS. State Div. Waterway, State Capitol, Springfield, Ill.

Edward Kraemer & Sons, Plain, Wis. Low Bidder. $86,553, grav. or crushed stone surf. 53,100 cu. yd. A.F.E. No. 52-113, the Richland Center-Viola Rd., S.T. Hy. 56 Richland Co.; Clarence Weiss, La Crosse, Wis., $67,304, grav. or crushed stone surf. 35,800 cu. yd. A.F.E. 27-112 and 61-115 the Melrose-Galesville Rd., S.T. Hy. 54, Jackson and Trempealeau Counties, WISCONSIN. State Hy. Comn., Madison, Wis. Bids Feb. 27. CD 2/13.

LOW BIDDERS—BUILDINGS

B. W. Handler Constr. Co., 23 W. Jackson St., Chicago, Ill., Low Bidder, $329,000, rehabilitation 7 bldgs. and service facilities at Galesburg State Research HOSPITAL, GALESBURG, ILL. State, State Capitol, Springfield, Ill. Bids Feb. 27. CD 2/16.

CONTRACTS—BUILDINBS

Wermuth, Inc., 1039 St. Marys St., Fort Wayne, Ind. Contract Awarded, approx. $400,000, 2 story 85x218 ft. wing, 42x48 ft., brick, rein.-con. WAREHOUSE and MAINTENANCE BLDG., FORT WAYNE, IND. Northern Indiana Public Service Co., R. L. Kaade, mrg., Fort Wayne, Ind. A. M. Strauss, 602 Strauss Bldg., Ft. Wayne, Ind., archt. Awarded Feb. 26. CD 3/16.

Ferro Concrete Constr. Co., 206 W. Third St., Cincinnati, O., Contract Awarded. Approx. $500,000, 1 story, 200x880 ft., brick, rein.-con. FACTORY ADDN., RICHMOND, IND. Crosley Div., Avco Mfg. Corp., J. W. Craig, mgr., Hale Rd., Richmond, Ind. Awarded Feb. 24. CD 3/1.

▲ Albert-Builders, Inc., 500 Keeler Bldg., Grand Rapids, Mich. Contract Awarded. $1,500,000. 125 HOUSING units incl. utility lines, Urbandale Sect., BATTLE CREEK, MICH. Battle Creek Lands, Inc., La Mora Park, Urbandale, Mich. CD 2/26.

WEST OF MISSISSIPPI

SOON LETS CONTRACT—BUILDINGS

Tex., Fort Worth—LABORATORY—Convair, Grants Lane, Fort Worth, soon lets contract 1 story, rein.-con. test laboratory. $300,000. F. C. Clayton, c/o owner, plan engr. CD 2/2.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

LOW BIDDERS—HEAVY CONSTRUCTION

Fielding & Shepley, 1258 Bohn Ave., St. Paul, Minn. Low Bidder, $132,917, Bridge 6692 over Soo Line Ry., Ramsey Co.; O. B. Ashbach & Sons Co., 2975 Hamline Ave. N., St. Paul, Minn., $146,146, Bridge 6693 over Phalen Waterway, 0.6 mi. north of St. Paul, Ramsey Co., MINNESOTA. State Hy. Dpt., St. Paul, Minn. Bids Feb. 23. CD 2/9.

Phelps-Drake Co., 1415 S.E. Eighth St., Minneapolis, Minn. Low Bidder. $45,595. 12 in. water main in Louisiana Ave. and Cedar Lake Rd., ST. LOUIS PARK, MINN. Village, J. Justad, clk., St. Louis Park, Minn. Bids Feb. 26. CD 1/26/50.

Phelps-Drake Co., 1415 S. E. Eighth St., Minneapolis, Minn. Low Bidder. $253,604. furnish, constr. sanitary sewers, ST. LOUIS PARK, MINN. Village, J. Justad, clk., St. Louis Park, Minn. Bids Feb. 26.

Hoak Constr. Co., 621 63 St., Des Moines, Ia. Low Bidder. $275,328. 287 mi. rural distr. lines, 93.25 mi. conversions, 5.85 mi. retirement in Scott and Wichita Counties, KANSAS, Wheatland Electric Cooperative, Scott City, Kan. Bid Feb. 21. CD 2/9.

† Moody & Johnson, Davis, Okla. Low Bidder. $78,399. flood control reservoirs near Cheyenne, on Washita River watershed in Sandstone Creek, OKLAHOMA. Soil Conservtion, 3600 McCart St., Fort Worth, Tex. Bids Feb. 16. CD 2/1.

Tellepsen Constr. Co., 1710 Telephone Rd., Houston, Tex. Low Bidder, $438,018, est. $450,000. rehabilitation and new docks, GALVESTON, TEX. Galveston Wharves, Inc., 2324 Strand St., Galveston, Tex. Bids Feb. 21. CD 2/14.

Fitzgerald & Bradshaw, Inc., Box 905, Donna, Tex. Low Bidder, $80,256, est. $100,000. 40 blocks street asph. paving, imprvs., concrete curbs and gutters, HARLINGEN, TEX. City, Harlingen, Tex. Bids Feb. 26. Kenneth Caldwell, city engr.

H. B. Jordan Co., Box 429, Plainview, Tex. Low Bidder, $194,744. est. $65,000. WW imprvs., Northeast Distr. Sys., LUBBOCK, TEX. City, Lubbock, Tex. Parkhill, Smith & Cooper, 1414 Avenue J, Lubbock, Tex., engrs.

Pittsburgh-Des Moines Steel Co., Praetorian Bldg., Dallas, Tex., Low Bidder, $50,380, est. $40,000. steel ground water storage tank; cancelled bids to have been opened Feb. 27, water distr. sys., $35,000, MARBLE FALLS, TEX. City, Marble Falls, Tex. CD 2/14.

LOW BIDDERS—BUILDINGS

Robert Paulus Constr. Co., 3441 Morganford Rd., St. Louis 16, Mo. Low Bidder. $602,975. 1 story, California type brick, rein.-con., steel, L-shaped, 69,000 sq. ft. SCHOOL, Cass Ave. between 19 and 20 Sts., ST. LOUIS, MO. Bd. Educ., V. Harry Rhodes, comr. School Bldgs., 911 Locust St., St. Louis 1, Mo. Bids Feb. 26. CD 2/15.

LeBlanc, Inc., 2518 Hudley St., Houston, Tex. Low Bidder, $329,197 CAFETERIA and NEGRO SCHOOL, HULL, TEX. Hull-Daisetta Independent School Dist., Liberty, Tex. Bids Feb. 27.

CONTRACTS—HEAVY CONSTRUCTION

Pittsburgh-DesMoines Steel Co., 915 Tuttle St., Des Moines, Ia. Contract Awarded. $36,300. 150,000 gal. steel water tank, GLENCOE, MINN. City, Glencoe, Minn., Selma S. Zavoral, clk. Bids Feb. 26. CD 2/15.

Cook Constr. Co., Hy. 80 W., Jackson, Miss. Contract Awarded. $34,600. excav. and shoal removal on approx. 30 mi. Ditch 1, varying in base from 24 to 125 ft., CAPE GIRARDEAU, MO., Little River Drainage Dist., Cape Girardeau, Mo. Bids Feb. 19. CD 2/1.

Southeast Constr. Co., Auburn, Neb. Contract Awarded. $121,000. paving, AUBURN, NEB. City, Auburn, Neb. Bids Feb. 26. CD 2/13.

City, City Hall, Oklahoma City, Okla. Own Forces. Approx. $200,000. traffic control imprvs., OKLAHOMA CITY, OKLA. CD 5/15.

▲ Oklahoma Contg. Co., Inc., Mercantile Bank Bldg., Dallas, Tex. Contract Awarded. Approx. $3,265,000. 65 mi. 20 and 30 in. welded joint natural gas loop lines, near Falfurrias, TEXAS. Tennessee Gas Transmission Co., Commerce Bldg., Houston, Tex. CD 6/6.

City, Edinburg, Tex. Own Forces. $65,000. sanitary sewers in areas inside city limits not now served, EDINBURG, TEX. CD 3/3/50.

L. F. Estes & Co., Pasadena, Tex. Contract Awarded. $39,000. water lines, in Oak Estates Suburb, HOUSTON, TEX. S. N. Adams & Co., 4001 Westheimer Rd., Houston, Tex. Awarded Feb. 20. CD 1/12.

L. F. Estes & Co., Pasadena, Tex. Contract Awarded. $62,185, sanitary and storm sewers in Oak Estates Suburb, HOUSTON, TEX. S. N. Adams & Co., 4001 Westheimer Rd., Houston, Tex. Awarded Feb. 20. CD 1/12.

L. F. Estes & Co., Pasadena, Tex. Contract Awarded. $62,235, est. $50,000. grading, base course, asph. street paving in Oak Estates Suburb, HOUSTON, TEX. S. N. Adams & Co., 4001 Westheimer Rd., Houston, Tex. Awarded Feb. 20. CD 1/12.

City, Laredo, Tex. Own Forces. $75,000. addnl. sanitary sewers, LAREDO, TEX. CD 11/23/49.

(Continued on page 70)

20 Million Yard Proof of Bucyrus-Erie Performance

Consistently high output regardless of weather or ground conditions makes Bucyrus-Erie walking draglines the choice for jobs like this twenty-million-yard channel improvement project in Louisiana.

One important reason is the exclusive Bucyrus-Erie walking mechanism for safe, smooth travel over soft or uneven ground. Others are strong, simple design and construction, assuring reliable performance when working in remote locations, and quickly responding controls for fast, efficient operation.

These outstanding features, backed by Bucyrus-Erie's unmatched manufacturing and engineering experience, add up to top-notch dragline service. The *years ahead* machines in the complete Bucyrus-Erie line provide a size to fit any job.

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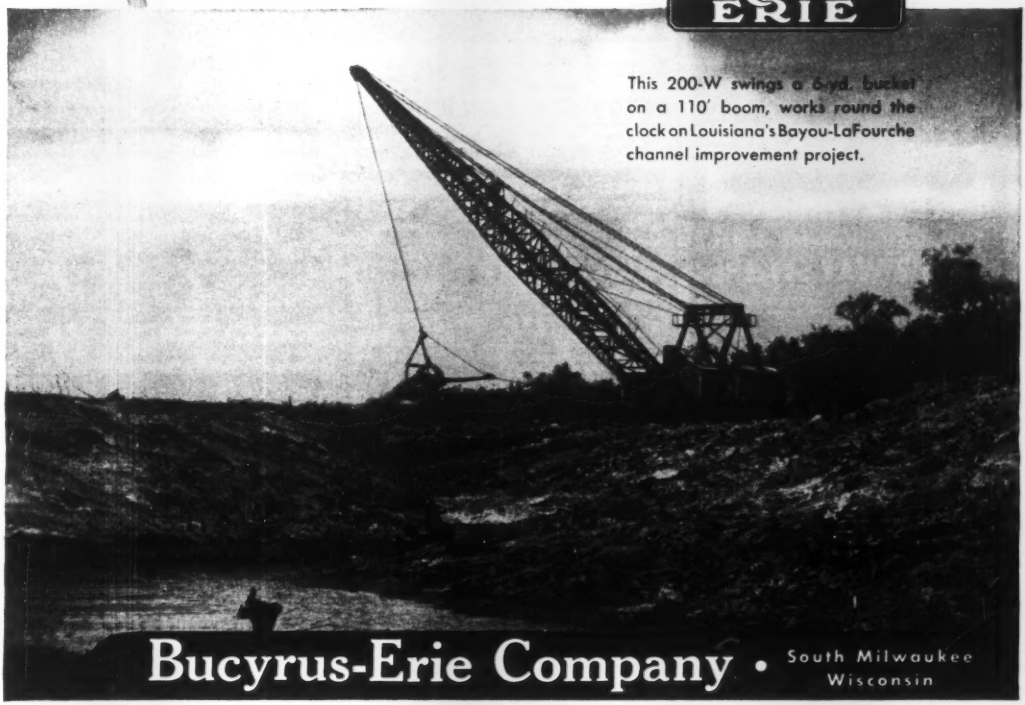

This 200-W swings a 6-yd. bucket on a 110' boom, works round the clock on Louisiana's Bayou-LaFourche channel improvement project.

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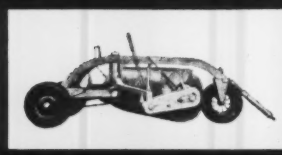

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GRACE 2-WAY SWEEPER

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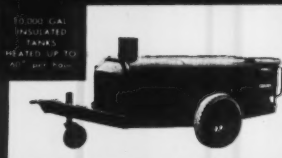

More Asphalt Heated per Hour with RAPID FIRE HEATER

W. E. GRACE MFG. CO.

6015 S. Lamar St. Dallas, Texas

(Continued from page 68)

City, Laredo, Tex. Own Forces. $62,500. addnl. street imprvs., paving, LAREDO, TEX. CD 11/23/49.

CONTRACTS—BUILDINGS

▲ **C. F. Braun & Co.**, 1000 S. Freemont Ave., Alhambra, Calif. Contract Awarded. Approx. $1,245,000. Unit 1, chemical refining PLANT, PORT NECHES, TEX. Jefferson Chemical Co., Port Neches, Tex. CD 2/28.

FAR WEST

LOW BIDDERS—HEAVY CONSTRUCTION

† **R. V. Lloyd Co.**, Coachella, Calif. Low Bidder, $348,326, earthwork, pipe lines, structures, lateral 94.2 part 1 of Unit 9, Coachella Valley Distribution System, All-American Canal System, Boulder Canyon Proj. Spec. DC-3284, ARIZONA, CALIFORNIA and NEVADA. Bureau Reclamation, Dpt. Interior, Coachella, Calif. Bids Feb. 20. CD 1/25.

▲† **A. Teichert & Sons**, Box 436, North Hollywood, Calif., Low Bidder, $1,867,539, Los Angeles River Imprvt., Fulton Ave., to Van Nys Blvd., CIVENG 04-353-51-49, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Feb. 27. CD 2/8.

† **Morrison-Kundsen Co., Inc.**, 319 Broadway, Boise, Idaho, Contract Awarded, $350,000, rehabilitate magnesium PLANT at MEAD, near SPOKANE, WASH. General Services Admin., F St. between 18 and 19 Sts. N. W., Wash., 25, D. C. Consolidated Services, Inc., Polson Bldg., Seattle, 4, Wash., engrs.

ALASKA

BIDS ASKED—HEAVY CONSTRUCTION

† **Alaska**—TELEPHONE EXXCHANGE—B.A. 3/27—U.S. Eng. (APO942, c/o PM, Seattle, Wash.) Anchorage, Alaska, telephone exchange at Eielson Air Force Base, Inv. No. S95-507-51-46. Plans deposit $25. CD 11/27.

CANADA

CONTRACTS—BUILDINGS

Doran Constr. Co. Ltd., 5 Concord St., Ottawa, Ont. Contract Awarded. Approx. $568,000, addnl. LABORATORY BLDG. at Research Council's, Montreal Road Laboratories, OTTAWA, ONT. Defence Constr. Ltd., 395 Fleet St. W., Toronto, Ont. CD 12/29.

PROPOSED PROJECTS

WATER SUPPLY

Ky., Louisville—Preston Street Road Water Distribution System, 945 Lotus Ave., water reservoir and exten., near here. $400,000. J. Stephen Watkins & Robert Martin, 142 High St., Lexington, consult. engrs.

Tex., Big Spring—City, voted bonds, water storage, incl. elevated steel tank and tower, $250,000; WW sys. extens. and existing sys. rehabilitation, $700,000. G. W. Dabney, city engr.

SEWERS, WASTE DISPOSAL

Del., Wilmington—Street & Sewer Dpt., Wilmington, sewage pump. station, Contr. 2, Brandywine Creek and Thatcher St., Contr. 2, $300,000. Whitman Requardt & Assoc., 1304 St. Paul St., Baltimore, Md., consult. engrs. CD 3/22/46.

Ill., Chicago—City, City Hall, Zone 2, auxiliary outlet sewers in Central South Side System Contr. 1-E, in S. LaSalle St. between Garfield and 63 Sts. in 57 St. between LaSalle and S. Wells Sts. in 57 St. between La Salle and Perry Sts., 60 St. between La Salle and Wentworth Sts. $541,764.

▲ **Ill., Chicago**—Sanitary Dist. of Chicago, 910 S. Michigan Ave., Zone 5, Lyons outlet for Salt Creek interceptor from 43 and Harlem Rd. to Lyons Village Sewer outlet, $660,000; 95 St. pumping station and new storm pumps, $440,000; Calumet Treatment plant, addnl. sludge drying units, $528,000; 7 mi. Harms Rd. interceptor sewer, $2,090,000; Howard St. interceptor sewer serving 30 square mile north of here and west of Edens Highway, $6,160,000; Oak Lawn outlet for Calumet interceptor sewer, serving 6½ square miles, $1,760,000; McCook outlet for southwest side interceptor extending under sanitary canal to intercept McCook Village sewer flow $110,000; completion West-Southwest sewage treatment works, $4,938,000; Upper Des Plaines interceptor sewer from River and Ron Rds. in Des Plaines to Mount Prospect, $165,000; Upper Des Plaines interceptor in Lasrence Ave. from Cumberland Av. to River Rd., $385,000. CD 2/8.

Ind., East Gary—Town, sewage disposal works and lines, $800,000.

▲ **La., New Orleans**—City, bond election Apr. 10, sanitary sewer imprvs. $5,000,000.

▲ **Mich., Livonia**—City, City Hall, 7 mi. interceptor sewer to connect Southfield Sewer line. $5,000,000. Hubbell, Roth & Clark, Inc., 2640 Buhl Bldg., Detroit, consult engr.

▲ **O. Zanesville**—City, sewage disoosal plant, etc. $3,000,000. Floyd G. Browne & Assoc., 413 E. Church St., Marion, consult. engrs. CD 2/2.

BRIDGES

▲ **D. C., Wash.**—Dist. Columbia, Chief Clerk, District Bldg., 1209 ft. deck type girder East Capitol St. Bridge over Anacostia River, incl. 6 lanes, 2 walks, $12,000,000. Jas. R. Edmunds Jr., 130 W. Hamilton St., Baltimore, 1, Md., assoc. archt. Harbeson, Hough, Livington & Larson, 117 S. 17 St., Phila., Pa., assoc. consult. archts. J. E. Greiner Co., 1201 St. Paul St., Baltimore, 2, Md., engr. CD 9/25.

▲ **La., New Orleans**—City, City Hall, bond election Apr. 10, grade separation imprvs. $7,000,000.

▲ **Massachusetts**—State Hy. Dpt., Boston, **Newburyport and Amesbury**—superstructure of continuous multi-span steel truss bridge, $2,000,000.

STREETS AND ROADS

† **Idaho**—Bureau P. Rds., Dpt. Commerce, Morgan Bldg., Portland, Ore.

Blaine Co.—grading Ketchum-Clayton Hy. with bridge near Galena store, $260,000.

Idaho Co.—grading Lewis and Clark Hy. near Powell ranger station, $220,000.

Lemhi Co.—grading, surf. north to Montana line, $255,000.

Teton Co.—grav. Victor-Irwin Hy. north of Swan Valley. $110,000.

▲ **La., New Orleans**—City, City Hall, bond election Apr. 10, street imprvs. $5,900,000.

▲ **Maine**—State Hy. Comn., Augusta,

Cumberland Co.—1st section 15 mi. expressway through Portland between end of Maine Turnpike in West Scarborough and Falmouth, incl. new bridge over Fore River. $25,000,000. Lucius Barrows, state hy. comr.

New Jersey—State Hy. Dpt., 1065 Parkway Ave., Trenton.

Atlantic Co.—repaving White Horse Pike from Egg harbor to Elwood. $300,000.

▲ **R. I., Cranston**—State, State House, Providence, interchange system of roads, Meshanticut Park, $2,500,000. Charles A. Maguire & Assoc., 1015 Turks Head Bldg., Providence, consult. engrs.

▲ **Washington**—State Hy. Dpt., Olympia,

Cowlitz Co.—ballast and surf. 12 mi. Lewis River Rd., Finn Hill to Yale, $240,000.

oiling 0.5 mi., Tower Rd. west, $5,000.

relocate 7 mi. Finn Hill-Areiel, $15,000.

Pacific Hy., service roads, Longview Wye to Castle Rock, $62,000.

ballasting and paving, Castle Rock-Toutle River, $377,500.

5.4 mi. Toutle River-Castle Rock. $520,000.

Wahkiakum Co.—Ocean Beach Hy. oiling 7.9 mi. Deep River east, $100,000.

surf. 4.3 mi. KM mountain east, $85,000.

relocate 2.5 mi. KM mountain west, $5,000. W. A. Bugge, state hy. dir.

Wash., Seattle—City, County-City Bldg., Zone 4, paving streets and sidewalks, with drainage, water mains in area between 4 Ave. S. and E. Marginal Way, south of Spokane St., $260,000. R. W. Finke, city engr.

EARTHWORK, WATERWAYS

Mich., Crystal Falls—Wisconsin-Michigan Power Co., Appleton, Wis., power dam, diversion canal, rein.-con., steel hydro-electric plant, $500,000. Mead & Hunt, 550 State St., Madison, Wis., consult. engrs. CD 1/24.

▲ **Tex., Houston**—City, City Hall, 900 Brazos St., site clearing, San Jacinto Dam area, clearing, removing and replacing railroad and existing pipe lines within boundaries of reservoir, $3,500,000. Howe & Wise, 4119 San Jacinto St., consult. engrs. CD 6/9/48.

Que., Lac Megantic—Village, O. Brullote, mgr., 1,200 ft. earthfill dam, 70 ft. high on Chandiere River near La des Araignees, $163,000; 32x85 ft. power house, two staff dwellings, 900 ft. spillway, open cut channel for discharge, Total est. approx. $600,000.

AIRPORTS

▲† **Fla., Pensacola**—JET AIRBASE—Dpt. Navy, Bureau Yards & Docks Annex, Arlington, Va., plans by Palmer & Baker, archts. and consult engrs., Staples Pake Bldg., Mobile, Ala., navy jet plane airbase near Fort Barancas, $7,950,000. CD 12/26.

Mo., Liberty—AIRPORT IMPRVS.—Pub. Wks., City Hall, Kansas City, Mo., plans by Gentry & Voskamp, 4 W. 13 St., Kansas City, Mo., imprvs., extensions to airport bldgs. $530,000. CD 1/8/45.

▲† **Tex., Grand Prairie**—HOUSING, etc.—Dpt. Navy, Naval Air Station, Dallas, housing $750,000; storm sewers, drainage, $65,000; street constr. and paving, $75,000; sanitary sewers, $75,000; water lines, facilities. $60,000 on 10 acre tract edge of Grand Prairie.

LATIN AMERICA

Mexico, Mexico City—Nacional Financiera, S. A., V. Carranza, 25, Mexico City, plans 1,000 vehicle yearly truck factory under contract with Fiat of Turin, Italy. $8,670,000.

PUBLIC BUILDINGS

▲ **Ala., Birmingham**—HOUSING—Jefferson County Housing Auth., c/o Chas. H. McCauley, archt., Jackson Bldg., 637 housing units at Graysville, Lewisburg, Adamsville, Gardendale, Mt. Olive, Mulga and Brookside. Approx. $4,000,000.

Calif., Clovis—SCHOOL—Clovis School Dist., 430 Woodsworth St., plans by Horn & Mortland, 1244 O St., Fresno School, $549,638.

▲ **Calif., Downey**—SCHOOL—Downey Union High School Dist., 8521 E. Firestone St., plans by Allison & Rible 625 S. Westmoreland St., Los Angeles, North Downey Junior High School. $1,000,000. CD 11/21.

Calif., Lawndale — SCHOOL — lawndale School Dist., 4110 W. 154 St., plans by H. L. Gogerty, 3123 W. 8 St., Los Angeles, concrete, frame, stucco 154 Street School addns. $600,000.

Calif., Puente—SCHOOL—Hudson School Dist., 15839 E. Rowland St., plans by Kistner, Curtis & Wright, 816 W. 5 St., Los Angeles, 1 story, frame, stucco Fairgrove School, Workman School and Gale Ave. School. $814,456. CD 1/24.

▲ † **Fla., Camp Blanding**—CAMP—U. S. Eng., 575 Riverside Ave., Jacksonville, reconversion and enlargement Camp Blanding, near Stark. Approx. $1,000,000.

▲ **Ill., Crystal Lake**—SCHOOL—Crystal Lake Bd. Educ., plans by Childs & Smith, 20 N. Wacker Dr., Chicago, Zone 6 brick, concrete, steel, stone community high school $2,000,000.

▲ **Ill., East St. Louis**—SCHOOLS—Bd. Educ., School Dist. 189, St. Clair Co., Bernice Goedde, pres., 240 N. 6 St., $1,200,000 bond election April 14, 2 addns. to schools and Junior High School new high school at 51 and State Sts., completing Lincoln High School, etc. CD 11/27.

Ill., River Forest—SCHOOLS—School Dist. 90, 7776 Lake St., plans by Perkins & Will, 309 Jackson St., Chicago, Zone 6, Willard, Lincoln and Roosevelt School addns., $860,000.

▲ **Ill., Roxana**—SCHOOL—Roxana Community Bd. Educ., Chaffer and Thomas Ave., $1,500,000 bond election late in March, 3 elementary schools, and high school addn.

† **Ind., Indianapolis**—ARMORY—Col. Harry A. Welch, Organized Reserve Corps, Federal Bldg., Indianapolis, 1 story, brick, concrete armory with 2 story section in center, $750,000.

Kan., Olathe—SCHOOL—Prairie School Dist. 44, Olathe, plans by Marshall & Brown, 114 W. 10 St., Kansas City, Mo., school, 72 St. Terrace and Row Sts., RFD from Kansas City, Kan., Johnson Co. $550,000.

▲† **Md., Edgewood**—CHEMICAL CENTER—U. S. Eng., 24 and Maryland Aves., Baltimore, Zone 18, plans by Ralph M. Parsons Co., 617 S. Olive St., Los Angeles, Calif., 1 story, 30x132 ft. explosive test chamber, $400,000; protective equip. laboratory, $400,000; high pressure laboratory, $25,000; 3,000 sq. ft. shop addn. for technical facilities for chemical warfare operations, etc., $50,000; 1 story, bsmnt., 43x92 ft., concrete low temperature test chamber, $325,000; radiological cold laboratory, $150,000; 1 story, 20x40 ft. radiological school storage bldg., $17,000; 60x80 ft. radiological school laboratory, $82,000; engineering experimental shops, $448,000; 40x120 ft. masonry pilot loading plant, $250,000, for Army Chemical Center. CD 10/27.

▲ **Mass., Acton**—SCHOOL—Towns of Acton, Bolton, Boxboro, Harvard, Lancaster and Stowe, regional high school, $1,492,800.

Mass., Boston—PLANETARIUM—Boston Museum of Science, plans by Ames, Child & Graves, 50 Beacon St., concrete, steel planetarium addn. to Museum on Charles River Esplanade. $500,000. R. M. Decker, 50 Beacon St., consult. engr.

▲ **Mass., Boston**—OFFICE—City, City Hall, School St., concrete, brick, steel office for Election Dpt. $1,000,000.

▲ **Mass., South Boston (Sta. Boston)**—MARKET—State Market Auth., 11 Beacon St., market, $15,000,000. Fay Spofford & Thorndike, 11 Beacon St., Boston, engr. Praeger Maguire Assoc., 294 Washington St., Boston, consult. engrs. CD 12/28.

▲ **Minn., Edina (Minneapolis P. O.)**—SCHOOL—Bd. Educ., M. H. Kuhlman, supt., voted $1,528,000 bonds Feb. 20, grade school, 59 St. and Concord Ave., $750,000, high school addn., 5701 Normandale Rd., $500,000. Lang & Raugland, 802 Wesley Temple Bldg., Minneapolis, archts. CD 2/14.

Minn., Pierz—SCHOOL—Independent School Dist. 6, M. Butorac, supt. Schools, $575,000 bond election Mar. 9, school, $450,000, Bettenburg, Townsend & Stolte, 1437 Marshall Ave., St. Paul, archts.

Minn., Rosemount—SCHOOL—Bd. Educ., Independent Consolidated School Dist. 5, L. J. Fluegel, chn., plans by Magney, Tusler & Setter, 202 Foshay Tower, Minneapolis, high school. $500,000.

Minn., Willmar—SCHOOLS—Bd. Educ., Alice Hedin, clk., defeated proposal to authorize a supplementary $525,000 bond issue, one separate grade school, two school addns. Magney, Tusler & Setter, 202 Foshay Tower, Minneapolis, archts. CD 2/16.

▲† **Mo., Weldon Spring**—ATOMIC ENERGY RESEARCH—Atomic Energy Comn., 1901 Constitution Ave. N. W., Wash. 25, D. C., atomic energy reserach development proj. on site of former Weldon Spring Ordnance Plant in St. Charles Co. $100,000,000.

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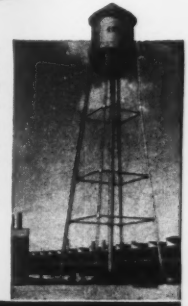

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▲ **Neb., Omaha**—SCHOOLS—Bd. Educ., 3902 Davenport St., Adams School addn. $445,000; Sherman School addn. $465,000; West Side School, $879,210; school, 42 and Grover Sts. $672,378; Harrison School addn, $520,000; replacement Monroe School, $665,000; school 66 St and Western Ave., $556,000. CD 5/8 and 5/10.

Neb., Sidney—HOSPITAL—Cheyenne Co., Sidney, plans by Frank McNett, Grand Island hospital. $660,000.

▲† **N. M., Albuquerque**—WAREHOUSE—U. S. Eng., Box 1538, Albuquerque, plans by Neuhner & Cabaniss, 1837 Campus Blvd., engrs.-archts., base spares warehouse. $1,750,000.

S. C., Spartanburg—HIGH SCHOOL—Spartanburg Co. Bd. Educ., Spartanburg, Duncan-Lyman High School. $750,000.

Tex., Austin—HIGH SCHOOL—Austin Independent School Dist., Austin, plans by Jessen, Jessen, Millhouse & Greeven, 2816 N. Guadalupe St., high school, 3 blocks east Travis Heights Blvd. and 2 blocks south of Live Oak St. $650,000. CD 1/25/46.

Tex., Avinger—HOUSING—Avinger Housing Auth., Avinger, 75 low-cost housing units. $575,000.

▲ **Tex., Conroe**—SCHOOLS—Conroe Independent School Dist., Conroe, voted bonds White elementary school, $500,000; Negro school, $800,000. Stone & Pitts, 1872 Calder St., Beaumont, archts. CD 10/2.

† **Tex., Fort Sam Houston**—ARMORY—U. S. Eng., 606 Santa Fe Bldg., Galveston, ORC armory, 10 unit structure and 2 vehicle sheds. $580,000.

▲ **Tex., Galveston**—SCHOOLS—Galveston Independent School Dist., Galveston, bond election Mar. 27 $500,000 each for White Senior High School, $2,850,000 and Negroes School, $1,150,000. R. R. Rapp, 417 Guaranty Bldg., and P. M. Geren, 905 N. P. Anderson Bldg., Fort Worth, archts. CD 2/15, under LB.

Tex., McGregor—HOUSING—McGregor Housing Auth., McGregor, 75 low-cost housing units. $575,000.

▲ **Wash., Kennewick**—SCHOOLS—School Bd., Kennewick, voted $300,000 bonds, 2 elementary schools, $1,000,000 each; Junior High School addn. to high school, $500,000.

▲ **B. C., Trail**—HOSPITAL—Trail Tadanac Hospital Bd., Trail, plans by Sharp & Thompson, Berwick, Pratt, 1553 Robson St., Vancouver, 150-bed rein.-con. hospital. $1,500,000. CD 6/8.

▲ **Ont., Atikokan**—HOUSES—Cetral Mortgage & Housing Corp., Kensington Bldg., Winnipeg, Man., 200 houses about 120 mi. west of Port Arthur. Approx. $1,500,000. K. J. Hurst, c/o owner, engr.

▲ **Que., Montreal**—HOSPITAL—Bd. Governors, 1560 E. Sherbrooke St., Notre Dame Hospital addn. $7,000,000.

COMMERCIAL BUILDINGS

▲ **Ariz., Tucson**—HOUSING—U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif., construct, manage and finance 300 unit 150 single dwellings units and 75 duplexes, for military personnel at Davis-Monthan Air Force Base. $2,400,000.

Calif., Arcadia—DWELLINGS Hirsh-Edmonds Bldg. Co., 246 S. Robertson Los Angeles, 76 frame, stucco dwellings in tract 16892. $722,000.

▲ **Conn., Hamden**—STORE, etc.—Sears, Roebuck & Co., 4640 Roosevelt Blvd., Phila., Pa., department store, warehouse and service station. $2,500,000. Westcott & Mapes, Inc., 109 Church St., New Haven, consult. engr. W. W. Davis, c/o owner, supervisor of construction. CD 1/19.

Del., Dover—APARTMENT DEVELOPMENT—Owner c/o Allen Hart, 913 Market St., Wilmington, apartment development. Approx. $300,000.

▲ **Mich., Flint**—HOUSING—Wimble Homes, Maynard Wimble, pres., Fleming Rd., one hundred fourteen 1½ story, 25x30 ft. houses incl. paving roads, sewers and water mains, etc. $1,102,000.

▲ **Mich., Kalamazoo**—COLLEGE—Kalamazoo College, Bd. Trustees, Kalamazoo, college expansion (8 year plan) for new bldgs., total $3,000,000; R. E. Olds Hall Science addn. this year $325,000.

▲ **Mich., Lansing**—HOUSING—Walter Neller Co., Walter Neller, pres., 115 W. Michigan St., 225 homes on 70 acres, Colonial Village Nos. 2 and 3, Gordon Ave., Pleasant Grove Rd. and Cooper Ave. $3,000,000.

▲ **N. Y., Brooklyn** — APARTMENT—B. L. Building Corp., 3036 Avenue V, plans by Julius Fishkind, 161-19 Jamaica Ave., Jamaica, N. Y., 6 story apartment on blocks bounded by Knapp, Brigham and Plumb First Sts. $2,600,000.

N. Y., Kew Gardens—APARTMENT—Harry Osias, 233 Broadway, New York, Zone 7, plans by Oscar I. Silverstone, 153 Pierrepont St., Brooklyn, Zone 2, 6 story apartment for 324 families, 83 Ave. and 135 St. $546,000.

O., Fremont—HOUSING—Herbert H. Brauchla, Lafayette, Ind., 100 homes on 27½ acre tract on east side, known as Highland Park Addn. $700,000-$1,000,000.

▲ **Pa., New Castle**—HOSPITAL—New Castle Hospital, New Castle, plans by Schmidt, Garden & Erikson, 104 S. Michigan St., Chicago, Ill., 3 story, 1 story 70x180 ft. brick, steel hospital addns. 2 wings. $1,129,000. CD 2/13.

Tex., Dallas—OFFICE—Maple Ave. Building Corp., 212 S. St. Paul St., plans by Walter W. Ahlschlager, 212 S. St. Paul St., 75,000 sq. ft. masonry office, Maple Ave. at Kittrell St. $750,000.

Tex., Houston — DWELLINGS — Embe Building Co., 3923 Purdue St., plans by Dunaway & Jones, 4919 Montrose St., Proj. 2, 28 dwellings, Idaho St., $360,000; Proj. 3, 32 dwellings, Radial and Ward Sts., $375,000, frame, concrete slab fdn. constr.

Tex., Houston—DWELLINGS—Rottersmann Builders, Inc., 5213 Linden St., 50 brick, dwellings concrete slab fdn., in new area of LaSalette Pl., south of Old Spanish Trail Rd., $500,000. J. G. Turney, Scanlan Bldg., consult. engr.

▲ **Tex., Houston**—DWELLINGS—Suburban Homes Co., c/o Lawrence & Tom O'Donnell, 9102 Humble Rd., 35 frame dwellings, concrete slab fdn., Crestline St. $320,000; 45 cedar shake, dwellings, concrete slab fdn. Pin Oak St., $382,500; 41 frame, cedar shake dwellings, concrete slab fdn., Parker and Wellington Sts., $348,500; 45 frame dwellings, concrete slab fdn., Darlington and Flint Ridge Rds., $360,000; 48 cedar shake dwellings, Springdale and Laura Koppe Sts. $352,000; 55 cedar shake, frame dwellings, Sundown, Ellingham, Fawnridge Sts., $440,000.

▲ **W. Va., Parkersburg**—TRAINING SCHOOL—St. Josephs Hospital, Parkersburg, plans by C. C. Palmer, Laird and Taft Sts., 5 story, bsmnt., 45x190 ft., brick, steel nurses training school, $1,000,000.

▲ **Man., Winnipeg**—OFFICE, etc.—Manitoba Telephone System, 156 Portage Ave. E., plans by Green, Blankstein & Russell, 310 Time Bldg., office, warehouse and garage, $1,000,000. CD 3/2/48.

Que., Louiseville—CHURCH—Parish of St. Antonie de Pardoue, Rev. Msgr. D. Baril, cure, plans by L. N. Audet, 52 Prospect St., Sherbrooke, interior completion church. Approx. $500,000. CD 2/10/49.

▲ **Que., Montreal**—HOSPITAL EXPANSION, etc.—Royal Victoria Hospital Bd., Pine Ave. W., Montreal, Que., Royal Victoria hospital expansion, imprvs., 9 story bldg. at rear main bldg., reconstr., modernize main bldg. at rear main bldg., constr. new Allan Memorial Institute Wing Approx. $7,000,000. CD 3/22/46.

▲ **Que., St. Charles Sur le Richeleiu**—HOME—L'Associatelon Catholique de l'aide aux Infirmes, Ile Aux Cerfs, Que., plans by Gascon & Parant, 934 St. Catherine St. E., Montreal, Home for Epileptics exten. at Ile Aux Cerfs, Approx. $1,500,000.

INDUSTRIAL BUILDINGS

Calif., Los Angeles—WAREHOUSE—D. M. O'Brien, 2155 E. 55 St., reinforced brick furniture warehouse, $100,000. Peter Whitehill, 1272 S. Bronson Ave., consult. engr.

▲ **Calif., Santa Monica**—AIRCRAFT FACTORY—Douglas Aircraft Co., Inc., 3000 Ocean Park Blvd., plans by J. Van Dyke, 803 W. 3 St., Los Angles, steel aircraft factory. $1,000,000. S. B. Barnes, 803 W. 3 St., Los Angeles, consult. engr.

▲ **Calif., Ventura**—PLANT ADDN., etc.—Union Oil Co. of California, 617 W. 7 St., Los Angeles, catalytic cracking plant addn., $5,000,000; petroleum terminal and undersea pipe line and feeder lines 8 mi. 8 in. and 1½ mi. 20 in. pipe, $800,000. Howard Robinson, c/o owner, engr.

Conn., Stamford—POWER PLANT—Connecticut Light & Power Co., 36 Pearl St., Hartford, power plant.

▲ **Ill., Chicago**—PLANT—Ford Motor Co., 7401 S. Cicero St., Chicago, Zone 29, plans by Albert Kahn Associated Architects & Engineers, Inc., New Centre Bldg., Detroit, Mich., rehabilitate plant of 6,000,000 sq. ft. $60,000,000. 10/12.

▲ **Ill., Skokie**—FACTORY—W. W. Welch Mfg. Co., 1515 N. Sedgwick St., Chicago, Zone 10, 1 and 2 story, 160,000 sq. ft., stone, brick, concrete, steel factory $1,100,000. Battey & Childs, 231 S. LaSalle St., Chicago, Zone 4, consult. engr.

▲ **Ind., Richmond**—PLANT—Avco Mfg. Corp., Crosley Div., N. Sheridan Ave., 200x888 ft., brick, steel plant, $1,000,000 or more with equipment.

▲ **Ia., Eddyville**—POWER PLANT—Iowa Southern Utilities Co., Centerville, power plant, $8,000,000. H. W. Bender, c/o owner, distr. engr. Edward de Rivera, c/o owner, engr.

▲ **La., Longville**—GASOLINE PLANT—Magnolia Petroleum Co., 335 N. Front St., New Orleans, casinghead gasoline plant, $2,000,000; gas gathering field line sys. $300,000; gas pipe line main to deliver field gas from central point to gas transmission line, $475,000.

▲ **Mich., Buchanan**—FACTORY—Clark Equipment Co., Industrial Truck Div., Battle Creek, brick, concrete factory. $2,500,000.

Mo., Pierce City—COMPRESSOR STATION—Cities Service Gas Co., 1st Natl. Bldg., Oklahoma City, Okla., 680 hp. compressor station, $218,960.

N. J., Hightstown—PLANT—Olsen Mfg. Co., Elyria, O., heating and air conditioning equip. mfg. plant.

▲ **N. Y., Lackawanna**—BLAST FURNACE—Bethlehem Steel Co., Lackawanna, blast furnace, 4 open hearth furnaces, 76 coke ovens, facilities for finishing steel. $100,000,000.

N. C., Durham—PLANT—Long Meadow Dairy, James and Cliff Sts., dairy plant addn. $100,000.

Okla., Welch—COMPRESSOR STATION—Cities Service Gas Co., 1st Natl. Bldg., Oklahoma City, 1200 h.p. compressor station, $386,400.

Pa., New Castle—FACTORY—Johnson Bronze Co., New Castle, 1 story concrete block, 3 story brick and block factory addn. (2 bldgs.). $100,000. James Downing, 500 S. Mill St., engr.

▲ **Pa., Phoenixville**—PLANT—Philadelphia Electric Co., 900 Sansom St., Phila., 6 story electric generating plant. $27,000,000. United Engineers & Constructors, Inc., 1401 Arch St., Phila., consult. engr. CD 2/23.

Tex., Houston—RICE MILL—Adolphus Rice Mills, Inc., 4600 Clinton Dr., rice mill expansion. $450,000.

▲ **Tex., Port Neches**—PLANTS—Jefferson Chemical Co., Port Neches, Tex. chemical plant units, Unit 2, $400,000; Unit 3, $350,000; Unit 4, $650,000, near here.

▲ **Tex., Port Neches**—PLANT—U. S. Rubber Co., Port Neches, addnl. expansion synthetic rubber plant. $1,000,000.

Tex., Rusk — CHICKEN HATCHERY — Syndicate, c/o Chamber of Commerce, Rusk, chicken hatchery. $150,000.

▲ **Tex., Waco**—POWER PLANT—Texas Power & Light Co., c/o John C. Young, 914 Austin St., rein.-con., brick, tile power plant (elec) on 2,000 acre tract near Brazos River. $4,000,000. Ebasco Services, Inc., 2 Rector St., New York, N. Y., consult. engrs. CD 2/15.

Wis., Green Bay—PLANT, etc.—Northern Paper Mills, Green Bay, 3 story, 50x65 ft. boiler plant addn., $200,000, Sargent & Lundy, 140 S. Dearborn St., Chicago, Ill., consult. engrs.; 3 story, 50x65 ft. evaporator bldg., $100,000, H. Gochnauer, co owner, engr.

Alta., Drumheller—STEAM BOILER—Canadian Utilities Ltd., 10523 Jasper Ave., Edmonton, supply, install 100,000 lb. steam boiler for power plant, Approx. $500,000. CD 10/30/46.

▲ **Alta., Fort St. John**—PLANT IMPRVS.—Canadian Utilities Ltd., 10523 Jasper Ave., Edmonton, power plant imprvs. Approx. $1,750,000.

▲ **Alta., Grande Prairie**—PLANT IMPRVS.—Canadian Utilities Ltd., 10523 Jasper Ave., Edmonton, power plant imprvs. Approx. $1,750,000. CD 3/30.

▲ **Alta., Vermilion**—PLANT IMPRVS.—Canadian Utilities,, Ltd., 10523 Jasper Ave., Edmonton, power plant imprvs. Approx. $1,750,000.

Ont., Haley Station—PLANT UNIT—Dominion Magnesium Ltd., 320 Bay St., Toronto, plant unit, 9 mi. northwest of Renfrew, Approx. $500,000.

Ont., Niagara Falls—PLANT—Norton Co. Ltd., Chippawa, plant exten. $500,000.

▲ **Ont., Thornold**—PLANT—Provincial Papers Ltd., 388 University Ave., Toronto, waste paper and bleaching plant, $1,000,000. H. K. Ferguson Co., 1783 E. 11 St., Cleveland, O., U. S. A., engr.

Ont., Toronto—WAREHOUSE—Canadian Tire Corp., Ltd., 837 Yonge St., plans by J. A. Thatcher, 37 Cowan Ave., 6 story, 106x133 ft., rein.-con., brick, tile warehouse passenger and freight elevators, $800,000. CD 1/9/45.

UNCLASSIFIED

Arkansas and Missouri—RURAL DISTRIBUTION LINES—Carroll Electric Co-operative Corp., W. Vernon Huston, engr., Berryville, Ark., 264 mi. single-phase 7,620 volt vertical type rural distr. lines in Benton, Harroll, Madison, Newton, Searcy, Boone and Pope Counties, Arkansas, and Barr and Stone Counties, Missouri Proj., Arkansas 18W, Carroll, $595,000. H. B. Gieb & Assocs. Engineers, Texas Bank Bldg., Dallas, Tex., consult. engrs. CD 4/1/49.

▲ **Kansas**—GAS LINES—Cities Service Gas Co., 1st Natl. Bldg., Oklahoma City, Okla., gas pipe line sys. connecting over 650 new gas wells, near Hugoton, $550,000; three 1,600 h.p. units compressor station, at Hugoton, $1,545,600; 6,400 h.p. compressor station, at Greensburg, $2,060,800; 8,000,000 cu. ft. capacity gas storage at Topeka, $350,000; 12,000,000 cu. ft. capacity field gas storage, Colony, $450,000. CD 6/7/46.

▲ **Mass., Boston**—HARBOR FACILITIES—City of Boston, State of Massachusetts, City Hall, Boston, plans by M. A. Dwyer Co., 24 School St., harbor facilities, Northern Ave., South Boston, 3,100 ft. wharf and filling in 2 old piers of New York, New Haven & Hartford R. R. $4,100,000. CD 4/17/44.

Mo., Kansas City—BOMB SHELTER—Baptist Memorial Hospital, c/o J. Guy Robertson, chn., 1020 McGee St., Zone 6, bomb shelter under entire 23¼ acre site at 63 St. between Troost St. and Rockhill Rd. $500,000.

▲ **N. C., Winston-Salem**—COLISEUM—Winston-Salem Foundation, Wacovia Bank, plans by Hall, Border & Donaldson, 2517 St. Paul St., Baltimore 18, Md., 1 story, 200x350 ft. steel, brick, concrete, concrete block coliseum. $1,200,000. L. F. Kooken, 2017 Maryland Ave., Baltimore 18, Md., engr.

O., Cadiz—PIPE LINE—Pittsburgh Consolidation Coal Co., Koppers Bldg., Pittsburgh, Pa., experimental pipe line sys. for transportation coal, near here. $550,000. Allen & Garcia Co., 332 S. Michigan Ave., Chicago, Ill., consult. engr.

Alaska—RURAL DISTRIBUTION LINES—Golden Valley Electric Assoc., Fairbanks, Alaska, 80 mi. rural distr. lines and sys. imprvs., Golden Valley Co. $800,000.

Philippine Islands, Manila—GAS SYSTEM—Manila Gas Corp., Manila, rehabilitation gas sys. 840,000 Pesos.

▲ **Quebec**—PIPE LINES—Champion Pipe Line Corp., Ltd., c/o Montgomery & Assocs., 1700 Royal Bank Bldg., Montreal, gas and oil pipe lines, Montreal, Approx. $5,000,000.

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CONSTRUCTION REPORTS—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES
April 3
Massachusetts

STREETS AND ROADS
March 20
Massachusetts

BIDS ASKED—BUILDINGS

▲ Conn., Windsor—HIGH SCHOOL—B.A. 3/27—Town, Town Hall, high school, Capen St. $2,000,000. Plans deposit $50. CD 5/5.

CONTRACTS—HEAVY CONSTRUCTION

† Great Lakes Dredge & Dock Co., 17 Battery Pl., New York, N. Y. Contract Awarded. $812,050. imprv. dredging in Boston Harbor, exten. 40 ft. channel from Commonwealth Pier I to head of Harbor to Mystic River, MASSACHUSETTS, U. S. Eng., P. O. Box 2316, Boston 7, Mass. CD 2/26, under LB.

CONTRACTS—BUILDINGS

▲ Leslie R. Porter, 126 Park St., Beverly, Mass. Contract Awarded. $1,000,000. MFG. BLDG., DANVERS, MASS. Hytron Radio & Electronic Corp., 76 Lafayette St., Salem, Mass. CD 2/2.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

STREETS AND ROADS
March 21
New York

Md., Baltimore—B.A. 3/21—City, Bureau Hys., 300 Municipal Bldg., Zone 2, Light St. water front imprvs., 125,00 cu. yd. earth fill, razing structures, 1,185 ft. timber bulkhead, placing rubble fill, concrete retaining wall and parapet. $800,000. Plans deposit $5. Jas. H. McKay, 303 Municipal Bldg., Zone 2, hys. engr. CD 11/17.

BIDS ASKED—BUILDINGS

N. Y., Rye—SCHOOL—B.A. 3/19—Bd. Educ., Parsons St., school, Midland Ave. between Apawamis Ave. and Goldwin St. $850,000. CD 2/8.

N. Y., West Babylon — SCHOOLS—B.A. 3/20—Bd. Educ. Union Free School Dist. 2, Great East Neck Rd., sub-structure for Elementary Junior High School addns. alterations, Great East Neck Rd., total est. $900,000; sub-structure. Santpogue elementary school Herzel Blvd. between 12 and 13 Aves., total est. $600,000. CD 9/5.

▲† N. Y., West Point—FAMILY QUARTERS—B.A. 3/27—U. S. Eng., 80 Lafayette St., New York, Zone 13, row housing, consisting 119 family apartments in 16 bldgs. at U. S. Military Academy. CD 2/14.

▲† N. Y., West Point—FAMILY QUARTERS—B.A. About 3/27—U. S. Eng., 80 Lafayette St., New York, Zone 13, family type quarters at U. S. Military Academy. $1,000,000-$2,000,000. Plans deposit $20. CD 8/13/48.

Pa., Phila.—TRUCKING TERMINAL, etc.—Bids Asked—Adley Express Co. Inc., Thompson and Pickwick Sts., (selected list bidders) trucking terminal and office. $600,000. Leon S. Caproni, 1221 Chapel St., New Haven, Conn., archt. CD 1/19.

SOON LETS CONTRACT—BUILDINGS

▲ N. Y., New York—CLINIC—Roosevelt Hospital, Gayer Dominick, pres. and Louis L. Dalefield, 428 W. 59 St., soon lets general contract Roosevelt Hospital Lower Memorial Clinic addn., 420-22 W. 59 St. $1,300,000. CD 2/15.

▲ Md., Baltimore—WAREHOUSE—American Radiator & Standard Sanitary Corp., Bessemer Bldg., Pittsburgh, Pa., soon lets contract steel, masonry, 388,000 sq. ft. warehouse and mfg. bldg., Eastern Ave. $1,000,000. Prack & Prack, 119 Federal St. N. W., Pittsburgh, Pa., archts.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ Depew Paving Co., Inc., 4955 Broadway, Depew, N. Y. Low Bidder. $3,734,780, est. $3,790,000. c. conc. pavement, misc. work, b. conc. opt. hy. Sep. 3 span alpha I-beam 143 ft. total; hy. sep. 4 span alpha I-beam 196 ft. total, R.R. sep. 12 span alpha I-beam 1,026.84 ft. total, R.R. sep. 4 span I-beam 196 ft. total 1.93 mi., cont. 0.7 mi. access Ontario Thruway (William St. to Walden Ave.) Broadway-Depew, Sh. 914, William St. County Road 207, Proj. No. UI-1071 (7), FA. OT.51-1, FA. RC. 51-4, FA. ST. 51-1, Erie Co., NEW YORK. Bureau Contracts & Accounts, Albany, N. Y. Bids March 7. CD 2/23.

LOW BIDDER—BUILDINGS

▲ Queens 69 Corporation, c/o Charles Spindler, archt., 164 Montague St., Brooklyn, 2, N. Y. will not construct 8 story APARTMENT, Queens Blvd. between 69 Rd. and 69 Ave., REGO PARK, N. Y. $1,100,000. Project abandoned. CD 5/11.

† Rogers & McGrath, 1221 Kenilworth Ave. N. E., Wash., D. C. Low Bidder. $815,000. constr. continuous wind tunnel bldg. 403, Naval Ordnance Laboratory, NOY 16863, Spec. 20757, WHITE OAK, MD. Pub. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C. Bids Feb. 14. CD 12/7.

CONTRACTS—HEAVY CONSTRUCTION

▲ Laurence J. Rice, Inc., 30 Deepdene Rd., Forest Hills, N. Y. Contract Awarded. $2,319,000. reconstruct Manhattan and Bronx approaches of Willis Avenue Bridge over Harlem River, Bronx and Manhattan Boros, NEW YORK, N. Y. Dpt. P. Wks., Municipal Bldg. New York 7, N. Y. Bids Jan. 17. CD 2/6, under LB.

CONTRACTS—BUILDINGS

▲ H. K. Ferguson Co., 1783 E. 11 St., Cleveland, O. Contract Awarded. $3,300,000. Two complete electronic tubes FACTORIES, approx. 330,000 sq. ft., on 100 acre tract, near ELMIRA, N. Y. Westinghouse Electric Corp., Union Bank Bldg., Pittsburgh, Pa.

▲ Harold F. Goetz, c/o Karl Bloch, archt., 7 Landsdown Ave., Merrick, N. Y. Owner Builds. $3,000,000. 92 one family HOUSES on 37 acre site bounded by Albany Post Rd. and Hudson River to be known as Sleepy Hollow Manor, NORTH TARRYTOWN, N. Y.

▲ Sordoni Constr. Co., Wilkes-Barre, Pa. and G. D. Campbell Building Co., Inc., 39 Cannon St., Poughkeepsie, N. Y. Contract Awarded. Est. $6,000,000. 2 addnl. 3 story structures will add 632,000 sq. ft. floor space for production of preparedness program contracts and are being build under a necessity certificate granted by U. S. Govt., PLANT addn. on Route 9, south of POUGHKEEPSIE, N. Y. International Business Machines Corp., Thomas J. Watson, chn. board, South Rd., Poughkeepsie, N. Y. Seelye, Stevenson & Value, 101 Park Ave., New York, N. Y. consult. engrs.

Nuovo Bros., Inc., 161-24 Northern Blvd., Flushing, N. Y. Contract Awarded. $913,468. four 3 story, frame, rein.-con., brick bldgs. HOUSING, TUCKAHOE, N. Y. Tuckahoe Housing Auth., Village Hall, Tuckahoe, N. Y. Bids Dec. 6. CD 12/14, under LB.

▲ Fletcher Park Estates, c/o Alwin Cassens, Jr., archt., 116-55 Queens Blvd., Forest Hills, N. Y. Owner Builds. Approx. $2,500,000. 167 one family HOUSES on tract at Hendrickson Ave., east of North Fletcher Rd., VALLEY STREAM, N. Y.

▲ Post Acres Corp., c/o Schuman & Lichtenstein, archts., 369 Lexington Ave., New York, N. Y. Owner Builds. Approx. $1,750,000. 175 one family HOUSES, on 43 acre site, Old Country Rd., WESTBURY, N. Y.

▲ O. H. Martin, 18 1st St., Sharpsburg, Pa. Contract Awarded. Approx. $2,000,000. DEPARTMENT STORE alterations, new elevators, escalators, air-conditioning, entrances, etc., PITTSBURGH, PA. Rosenbaum Co., Penn Ave., and 6 St., Pittsburgh, Pa. E. E. Ashley, 10 E. 40 St., New York, N. Y., archt.

▲ H. K. Ferguson, Inc., 19 Rector St., New York, N. Y. Contract Awarded, approx. $10,000,000. 600 x 1500 ft. PLANT, NEWARK, DEL. Chrysler Corp., 405 Lexington Ave., New York, N. Y. Bids Mar. 5. CD 3/1. Bids for construction of 2 story office bldg. and powerhouse will be accepted competitively later this month.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES
March 20
Virginia

STREETS AND ROADS
March 20 — Virginia
March 21 — Louisiana

BIDS ASKED—BUILDINGS

Fla., Bartow—HOSPITAL—B.A. 3/27—Polk Co., Bartow, hospital addn. $485,000. A. L. Aydelott & Assocs., 2080 Peabody St., Memphis, Tenn., archts. CD 2/8.

LOW BIDDERS—BUILDINGS

▲ Claussen-Webster Constr. Co., Augusta, Ga. Low Bidder, $1,895,500, HOUSING UNITS, AUGUSTA, GA. Augusta Housing Auth., c/o Willis, Irwin & Helen S. Irwin and Lyman H. Robertson, archts., 722 Greene St., Augusta, Ga. Bids Mar. 1. CD 2/8.

† Alabama Polytechnic Institute, Auburn, Ala., rejected bids Jan. 30, WOMENS DORMITORY, AUBURN, ALA. L. B. $1,959,200. CD 2/8, under LB.

▲ State Div. Admin., c/o J. H. Rester, comr., Shreveport, La. rejected bids Feb. 14, 7 story nursing school, SHREVEPORT, LA. L. B. $2,037,000. CD 2/20, under LB.

▲ Foster & Creighton Co., American Natl. Bank Bldg., Nashville, Tenn. Low Bidder. $2,059,500. STATE LIBRARY and ARCHIVES BLDG., NASHVILLE, TENN. State of Tennessee, Nashville, Tenn. Bids Feb. 27, CD 1/26.

CONTRACTS—HEAVY CONSTRUCTION

▲ Williams Bros. Co., Natl. Bank Tulsa Bldg., Tulsa, Okla., Contract Awarded. $1,026,000. 102 mi. 14 *in.* natural gas line, Anderson, Laurens, Greenville, Spartan-

burg and Cherokee Counties, SOUTH CAROLINA. Plantation Pipe Line Co., Box 1743, Atlanta, Ga.

CONTRACTS—BUILDINGS

▲ **English Constr. Co.,** Altavista, Va. Contract Awarded. $1,057,740. Highland Springs HIGH SCHOOL, HIGHLAND SPRINGS, VA. Henrico Co., Richmond, Va. Bids March 1, awarded March 2. CD 10/25.

▲ **Daniels Constr. Co.,** Greenville, S. C. Contract Awarded. Approx. $1,200,000. 40,000 sq. ft. rayon weaving MILL addn., WILLIAMSTOWN, S. C. Textron, Inc., c/o contractor.

▲ **Daniel Constr. Co. of Ala., Inc.,** 822 7 Ave. S., Birmingham, Ala., Contract Awarded, Approx. $5,000,000, rayon yarn PLANT, to be operated by North American Rayon Corp., CHILDERSBURG, Ala. Beaunit Mills, Inc., c/o contractor. CD 3-1.

▲ **Cowan Lumber & Planing Mill,** 1419 Clinton St., Nashville, Tenn., Contract Awarded. $1,640,000. 200 Negro HOUSING units, NASHVILLE, TENN. Nashville Housing Auth., 701 N. 6 St., Nashville, Tenn. Bids Jan. 25. CD 2/7, under LB.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

March 23 Michigan — March 27 Wisconsin

STREETS AND ROADS

March 23 Michigan — March 27 Wisconsin

SOON LETS CONTRACT—BUILDINGS

▲ **Wis., Milwaukee**—GARAGE—P. S. Investment Co., 2560 N. 32 St., Milwaukee, Zone 10, soon lets contract 1 story, 200x358 ft., steel brick postal garage, $1,000,000. Geo. Zabel & Bro., 424 E. Wells St., engrs. U. S. Post Office Dpt., lessee. CD 1/16.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **S. N. Nielsen Co.,** 3059 W. Augusta St., Chicago, Ill., Low Bidder, $3,149,000 stone exterior facing, $3,139,000 brick, est. $4,275,000, for main bldg. and outside piping***Chicago Bridge & Iron Co., 332 S. Michigan St., Chicago, Ill., $91,800, est. $100,000, elevated tanks and chemical bins***Dorr Co., 221 N. La Salle St., Chicago, Ill., $172,687, est. $350,000, work on dry mix and settlement equip.***Brady Conveyors Corp., 20 W. Jackson St., Chicago, Ill., $25,739, est. $50,000, conveyor system***Bass Eng. & Constr. Co., 215 Birmingham Theatre Bldg., Birmingham, Mich., $738,800, $803,800 and $778,900, est. $960,000, filtering equip., for water treatment plant, DAYTON, O. City, City Hall, Dayton, O. Bids Feb. 28. CD 2/21.

CONTRACTS—HEAVY CONSTRUCTION

Standard Paving Co., 30 N. LaSalle St., Chicago, 2, Ill., Contract Awarded, $823,224, c. conc. paving 4.18 mi. U. S. Route 40, Clark Co., ILLINOIS State Div. Hys., State Capitol, Springfield, Ill. Bids Jan. 19, awarded Feb. 8. CD 1/24, under LB.

CONTRACTS—BUILDINGS

▲ **H. K. Ferguson Co.,** 1783 E. 11 St., Cleveland, O. Contract Awarded, $4,000,000. PLANT for defense production, DAYTON, O. National Cash Register Co., S. Main St. and K. Dayton, O.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

March 20 Iowa — March 21 Kansas

STREETS AND ROADS

March 20 Iowa — March 21 Kansas

March 23 Texas

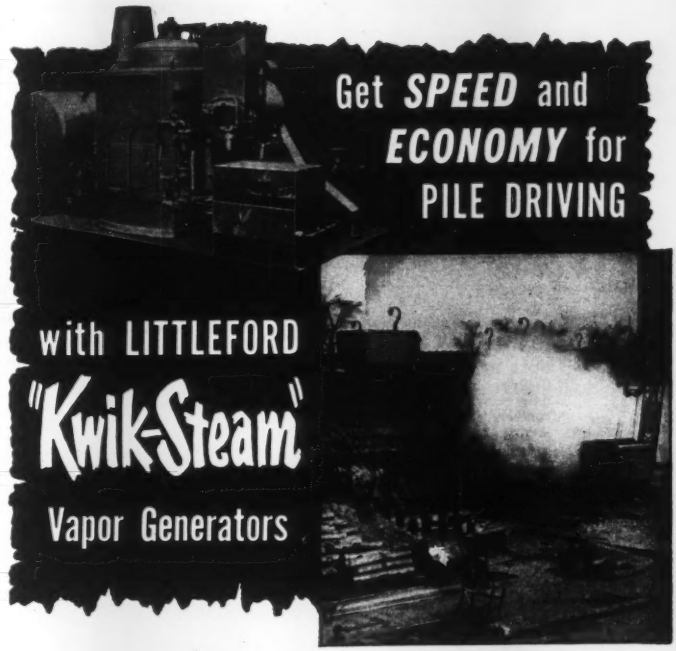
▲ **Missouri**—RURAL DISTRIBUTION LINES—B.A. About 3/22—Intercounty Electric Co-operative Assn., Licking, 734 mi. rural distr. lines, 136 mi. conversions in Maries, Gasconade, Phelps, Crawford, Dent, Texas, Shannon and Pulaski Counties. Sect. Proj. 18 S and V Texas. $1,000,000. Frank Horton & Co., Lamar, engrs. CD 2/19.

BIDS ASKED—BUILDINGS

Minn., Brainerd—HOSPITAL—B.A. 3/20—Benedictine Sisters Benevolent Assn., Mother M. Athanasius, OSB, Villa Sancta Scholastica, Kenwood Ave., Duluth, 4 story, bsmnt., 54x233 ft., 49x102 ft. wing St. Joseph's Hospital. $800,000. Plans deposit $100. Maguolo & Quick, 4908 Delmar Blvd., St. Louis 8, Mo., archts.

▲† **Tex., Amarillo**—ADMINISTRATION, etc.—B.A. 3/22—U. S. Atomic Energy Comm., c/o Joseph R. Turan, Los Alamos, N. M., Contr. A, 1 story, 24,500 sq. ft. administration bldg., $375,000; Contr. B, 15,300 sq. ft. transportation shops, utilities, $350,000; Contr. C, new enclosed, insulated steel frame ramps, 6,160 lin. ft., $525,000; Contr. D, rehabilitation 4,456 lin. ft. existing ramps, $250,000, Inv. No. 291-51-80. Extended date. CD 2/1.

Tex., Conroe—SCHOOL—B.A. 3/27—Conroe Independent School Dist., Conroe, masonry Booker T. Washington



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SCHOOL, (incl. combination elementary and Junior and Senior High Schools). $800,000. Stone & Pitts, 1872 Calder St., Beaumont, archts. CD 2/28.

Tex., Fort Worth—HIGH SCHOOL—B.A. 3/27—Fort Worth Independent School Dist., Fort Worth, Ridglea Junior High School. $500,000. Plans deposit $25. Extended date. Wilson & Patterson, 202 Majestic Bldg., archts. CD 2/27.

▲ **Tex., Snyder**—HIGH SCHOOL—B.A. 3/27—Snyder Consolidated Independent School Dist., Snyder, 120,000 sq. ft. high school. $2,300,000. Plans deposit $50. Buford & Feinberg, 326 Interurban Bldg., Dallas, archts. CD 12/19.

Tex., Waco—HOSPITAL—B.A. 3/27—Hillcrest Memorial Hospital, Waco, Tex., 5 story hospital, $650,000. Plans deposit $50. Frank T. Drought, 117 W. Pecan St., San Antonio, engr. Walter Cocke, Jr. & Co., 1507 Franklin St., Waco, archts. CD 1/15.

▲† **N. M., Los Alamos**—BUILDINGS—B.A. 3/28—U. S. Atomic Energy Comn., Los Alamos, buildings, facilities, rein.-con. type, Group 131, Rrea TA-16, Proj. J. Inv. No. 291-51-78. $1,000,000. Plans deposit $50. Extended date. CD 1/26.

Mo., Springfield—COLD STORAGE—Bids Asked—Producers Produce Co., 501 N. Main St., cold storage bldg., Grant St. between Phelps and Tampa Sts. $500,000. Johnson & Robinett Associated Architects & Engineers, 1043 Landers Bldg., archts. CD 1/12.

SOON LETS CONTRACT—BUILDINGS

Colo., Denver — HOSPITAL —National Jewish Hospital, 3800 E. Colfax Ave., soon lets contract 3 story, full bsmnt., 55x235 ft., rectangular shape, rein.-con., brick hospital. $850,000. Earl C. Morris, 518 Empire Bldg., Denver, engr. and archt. CD 7/31/45.

LOW BIDDERS—HEAVY CONSTRUCTION

▲† **Benson Clearing Co.**, Muskogee, Okla. Low Bidder, $1,997,020, est. $2,507,600, clearing land in Bull Shoals Reservoir area, Cotter, ARKANSAS. U. S. Eng., 300 Broadway, Little Rock, Ark. Bids Feb. 27. CD 1/31.

LOW BIDDERS—BUILDINGS

▲ **Independent School Dist. of Keokuk**, Roy L. Krueger, pres. Bd. Directors, Keokuk, rejected bids Jan. 20, rein.-con., brick, steel Senior high SCHOOL, KEOKUK, IA. L. B. Base $1,384,910. CD 2/12, under LB.

▲ **Linebarger Constr. Co.**, 222 Scott St., Little Rock, Ark. Low Bidder, $1,208,329. HOUSING, LITTLE ROCK, ARK. Little Rock Housing Auth., 313 Commercial Bank Bldg., Little Rock, Ark. Bids Feb. 27. CD 2/12.

▲† **Grafe-Shirley-Lane Co.**, 714 W. Olympic St., Los Angeles, Calif. Low Bidder. $1,796,542. POWERHOUSE and electric switchyard, incl. turbines and equip. at Hungry Horse Dam, Hungry Horse Proj. Spec. DC 3282, MONTANA, Bureau Reclamation, Hungry Horse Gov't Camp, Columbia Falls, Mont. Bids Mar. 1. CD 1/29.

CONTRACTS—HEAVY CONSTRUCTION

▲ **Lancaster & Love, Inc.**, 905½ W. Jefferson St., Dallas, Tex. Contract Awarded, $1,525,838. Sewer Imprvs., PINE BLUFF, ARK. City, Pine Bluff, Ark. Bids Feb. 26, awarded Mar. 1. CD 2/9.

▲ **Northern Natural Gas Co.**, Aquila Court, Omaha Neb. Owner Builds. $33,095,000. 221.8 mi. gas pipe lines in TEXAS, OKLAHOMA, KANSAS, NEBRASKA and MINNESOTA and compressor stations in TEXAS, KANSAS, NEBRASKA and IOWA. CD 12/27/48.

▲ **Bennett Constr. Co.**, 114 Taylor St., Topeka, Kan. Contract Awarded. $2,508,167, general constr. field house and armory at Kansas University, LAWRENCE, KAN. State Bd. Regents, State House, Topeka, Kan. CD 1/23, under LB.

Austin Bridge Co., P. O. Box 1590, Dallas, Tex. Contract Awarded. $947,746. Canadian River Bridge and approaches Hy. U. S. 60 and 83. Proj. F 621 (8) and F 158 (10), Hemphill Co., TEXAS. State Hy. Comn., Austin, Tex. Bids Feb. 21, awarded Feb. 28. CD 2/26, under LB.

CONTRACTS—BUILDINGS

▲ **The Wedding Constr. Co.**, 4012 15 St., Des Moines, Ia. Owner Builds, $5,000,000. 500 DWELLINGS, at CLINTON and COMANCHE, IA.

▲ **Carson Constr. Co.**, 603 Topeka St., Topeka, Kan. Contract Awarded. $1,000,000. APARTMENT HOTEL, 7 and Harrison Sts., TOPEKA, KAN. Joe Casson, 603 Topeka St., and Charles Cooke, pres. Prudential Investment Co., National Bank of Topeka Bldg., Topeka, Kan. Raymond Coolidge, New England Bldg., Topeka, Kan., archt.

▲ **Marye-Nothwestern Co.**, 2000 W. 8 Ave., Denver, Colo., Contract Awarded, $1,637,777, constr. Sun Valley HOMES, Housing Project Colo. 1-8, incl. 39 one and two story bldgs. for housing and 1 maintenance bldg. incl. 200 units, DENVER, COLO. Denver Housing Auth., 144 Navajo St., Denver, Colo. Bids Jan. 9. CD 2/13, under LB.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
STREETS AND ROADS

March 28 — California
March 29 — California

▲† **California**—B.A. 3/27—U. S. Eng., 751 S. Figueroa St., Los Angeles, Rio Hondo Channel Imprvt., Downey, CIVENG 04-353-51-23, Approx. $1,000,000.

▲ **Calif., Los Angeles**—TRANSIT SHED—B.A. 3/28—Los Angeles Harbor Dpt., City Hall, transit shed facility, Berths 196, 197, Spec. 1162, $3,000,000. Extended date. E. Earl, harbor engr.

LOW BIDDERS—HEAVY CONSTRUCTION

▲† **Donovan-James Constr. Co.,** Arctic Bldg., Seattle, 4, Wash., Low Bidder, **$3,839,148,** est. $3,182,920. second-stage construction at Albeni Falls Dam, incl. constr. spillway dam, Serial No. CIVENG 45-108-51-38, IDAHO, U. S. Eng., 4735 E. Marginal Way., Seattle, 4, Wash. Bids Mar. 1. CD 1/15.

▲ **Allis-Chalmers Mfg. Co.,** 1126 S. 70 St., Milwaukee, Wis. Low Bidder. **$3,416,000,** six 250,000 kva. generators; **$3,925,000** 6 hydraulic turbines for direct connection to 25,000 kva. generators at Rock Island Dam, being enlarged in $26,000,000 project, WENATCHEE, WASH. Chelan County PUD, c/o Stone & Webster Eng. Corp., engrs., 49 Federal St., Boston Mass. Bids Feb. 19. CD 1/23.

▲ **United Concrete Pipe Corp. & Ralph A. Bell,** Box 425, Baldwin Park, Calif. Low Bidder. **$1,396,954,** grading, surf., structures etc. Santa Ana Freeway, Los Angeles Co., CALIFORNIA State Div. Hys., 120 S. Spring St., Los Angeles, Calif. Bids Mar. 1. CD 2/13.

LOW BIDDERS—BUILDINGS

▲ † **George W. Carter Co.,** 1721 W. Olympic Blvd., Los Angeles, Calif. Low Bidder. **$1,273,967,** constr. addnl. FACILITIES for Salt Wells Pilot Plant, Spec. 26903, INYOKERN, CALIF. Naval Ordnance Test Station, Inyokern, Calif. Bids Mar. 1. CD 2/20.

▲ **William & Burrows,** 10 California Dr., Burlingame, Calif., Low Bidder. **$1,779,500,** 1 and 2 story, San Carlos-Belmont School, 30 acres site on Almeda de las Pulgas High School Plant, REDWOOD CITY, CALIF. Sequoia Union High School Dist., Redwood City, Calif. Bids Feb. 23. CD 1/15.

CONTRACTS—HEAVY CONSTRUCTION

▲ **Allis-Chalmers Mfg. Co.,** 1126 S. 70 St., Milwaukee, Wis., Contract Awarded, **$3,416,000,** six 22,500 kva generators; **$3,925,000,** 6 hydraulic turbines for direct connection to 25,000 kva generators at Rock Island Dam being enlarged in $26,000,000 project, WENATCHEE, WASH. Chelan County PUD, c/o Stone & Webster Eng. Corp., engrs., 49 Federal St., Boston, Mass. Bids Feb. 19. CD 3/7, under LB.

CONTRACTS—BUILDINGS

▲ **A. Ritchie Co.,** 2102 Melrose St., Walla Walla, Wash., Contract Awarded. **$1,028,910,** est. $700,000. 1 story, 70,000 sq. ft., rein.-con. Jason Lee SCHOOL, RICHLAND, WASH. School Dist. 400, Richland, Wash. Bids Jan. 24. CD 1/31, under LB.

▲† **Drake & Mullen,** 621 9 Ave. N. Seattle, Wash., Contract Awarded. **$1,690,000,** 58 BUILDINGS at Yakima firing center, YAKIMA, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle, 4, Wash. Bids Feb. 23. CD 2/28, under LB.

▲ **Macco Corp.,** 14409 S. Paramount Blvd., Paramount, Calif., Contract Awarded, **$2,321,000,** steam electric generating PLANT alterations, LONG BEACH, CALIF. Southern California Edison Co., 601 W. 5 St., Los Angeles, Calif.

ALASKA

BIDS ASKED—BUILDINGS

Alaska, Juneau—SCHOOL—B. A. 3/27—Independent School Dist., Juneau, school. $750,000. Plans deposit $25. Foss, Malcolm & Olsen, Goldstein Bldg., Juneau, archts. CD 2/28.

LOW BIDDERS—BUILDING

▲† **Valle-Sommers Constr. Co.,** 407 3 Ave. W., Seattle, Wash. Low Bidder. **$1,423,400,** est. $1,359,995. ordnance vehicle repair SHOP, Inv. No. 51-34, FORT RICHARDSON, ALASKA. U.S. Eng. (APO 942 c/o PM, Seattle, Wash.) Anchorage, Alaska. (Correction—low bidder). Bids Feb. 28. CD 3/6, under LB.

CANADA

BIDS ASKED—BUILDINGS

Ont., Goderich—SCHOOL—B.A. 3/20—Shore & Moffat, archts., 79 Queen St. E., Toronto, 1 story H-shaped, steel, brick high school for Goderich District Collegiate Institute Bd., A. R. Scott secy., Goderich, Approx. $500,000. Plans deposit $25. CD 11/27.

LOW BIDDERS—BUILDINGS

▲ **Redfern Constr. Co. Ltd.,** 88 Laird Dr., Toronto, Ont. Low Bidder, **$2,957,000,** 10 story, bsmnt., 123x135 ft. rein.-con. black granite, brick POSTAL STATION Q St. Clair and Yonge Sts., TORONTO, ONT. Dpt. P. Wks., Hunter Bldg., Toronto, Ont. Bids Feb. 28 CD 2/5.

CONTRACTS—BUILDINGS

▲ **Bird Constr. Co. Ltd.,** Lethbridge, Alta. Contract Awarded, **$1,646,000,** est. $1,150,000 2 BARRACK BLOCK and two 500-men MESSES, SHILO, MAN. Defense Constr. Ltd., Kensington Bldg., Winnipeg, Man. Bids Dec. 6. CD 11/22.

▲ **Anglin-Norcross Quebec Ltd.,** 892 Sherbrooke St. W., Montreal, Que. Contract Awarded. Approx. **$1,000,000,** PLANT UNIT, Cumberland St. and OFFICE, William St., CORNWALL, ONT. Canadian Cottons Ltd., 760 Victoria Square, Montreal, Que. Lockwood Green Engineers Inc., 40 Central St., Boston, Mass., U. S. A., engr. CD 2/2.

OFFICIAL PROPOSALS

Bids: March 28, 1951

Pumping Station

CITY OF NORFOLK, VIRGINIA

Proposals will be received by the Department of Public Works, Room 203, City Hall, Norfolk, Virginia, for constructing Lake Prince Pumping Station No. 2 and other work, Contract No. 8, until 12 noon, E.S.T., Wednesday, March 28, 1951 at which time and place they will be publicly opened and read.

Bids shall be enclosed in two envelopes. The inner envelope shall be endorsed "Bids for Contract No. 8" and shall also be marked with the name of the company and the Virginia contractor's license number. The outer envelope shall be addressed to the Department of Public Works.

Contract No. 8 embraces the construction of Lake Prince Pumping Station No. 2, modifications and/or additions to Lake Prince Pumping Station No. 1, Blackwater Pumping Station, Nottaway Pumping Station and Burnt Mills Pumping Station.

Each bid shall be accompanied by a certified check in the amount of Twenty-Five Thousand Dollars ($25,000.00) made payable to Alex H. Bell, Treasurer of the City of Norfolk, Virginia.

Drawings and Specifications may be obtained from the office of the Department of Public Works of the City of Norfolk, or from the office of Whitman, Requardt and Associates, 1304 St. Paul Street, Baltimore 2, Maryland, upon deposit of Fifty Dollars ($50.00) for each set of drawings and specifications, which deposit will be returned upon return of the plans and specifications in good condition.

The City reserves the right to reject any or all bids and to accept the bid which in its opinion best serves the interests of the City.

H. H. George, 3rd
Director of Public Works

U. S. Government

General Services Administration, Public Buildings Service, Washington, D. C., March 7, 1951.—Sealed bids in duplicate for Construction of the Wardwell Yards Facility Warehouses at Warren, Ohio will be received until 1:00 P.M., Standard Time, on March 27, 1951, in Room No. G-341, General Services Building, Washington, D. C., and then publicly opened in Room No. G-341-B. Bid guarantee is required. If the amount of the contract exceeds $2000, U. S. Standard Form No. 23, Construction Contract, will be used and performance and payment bonds will be required. Upon request one set of Prebid Documents and two sets of drawings and specifications will be supplied without charge to each general contractor interested in bidding on the complete project, all of which must be returned. Not more than six additional sets of drawings and specifications may be obtained by general contractors at a charge of $5.00 per set, which will be refunded for each set returned in good condition within 10 days after the bids are opened. Checks offered as payment must be made payable to the order of the Treasurer, U. S. Upon request and in the discretion of the undersigned one set of drawings and specifications will be furnished to builders' exchanges, chambers of commerce and other similar organizations, with the understanding that the set will be retained on their premises and made available for inspection by an interested sub-contractor or material firm. Bidding material may be obtained at Room No. 1304 General Services Building, 19th and F Streets, N. W., Washington 25, D. C., Phone EXecutive 4900, Extension 2397. W. E. Reynolds, Commissioner of Public Buildings Service, General Services Administration.

(Continued on page 78)

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U. S. Government
(Continued from page 77)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3338) will be received by Bureau of Reclamation, Denver, Colorado, until April 4, 1951, and then publicly opened for furnishing labor and materials and performing all work for the construction of Gore Junction-Muddy Pass 69-kilovolt transmission line, Colorado-Big Thompson Project. The work is situated from approximately 5 miles northwest of Kremmling, Colorado, to a point near Muddy Pass. This work will consist of approximately 22 miles, 69-kilovolt, 3-phase, single-circuit, wood-pole, H-frame type transmission line without overhead ground wires; and other work. Completion is desired in 250 days. For particulars, address Bureau of Reclamation, Grand Lake, Colorado; or Building 1-A, Denver Federal Center, Denver, Colorado.

OFFICIAL PROPOSALS

Bids: March 19, 1951

The Delaware Memorial Bridge Contract No. 13—East Approach Paving

Sealed proposals for the paving of the east highway approach to "The Delaware Memorial Bridge" over the Delaware River near Wilmington, Delaware will be received by the Delaware State Highway Department at the office of the Director, Delaware Crossing Division, Continental American Building, Wilmington, Delaware, until 12 o'clock noon Eastern Standard Time, March 19, 1951 at which time and place said proposals will be publicly opened and read.

The work involves the following approximate principal quantities:

Selected Material (For Pavement Subbase)	8,260 cu. yds.
Cement Concrete Pavement	4,630 cu. yds.
Wire Mesh Reinforcement	1,600 squares
Cement Concrete Curb	4,336 lin. ft.
Bituminous Concrete Pavement	250 tons
Guard Rail (Steel Beam Type)	1,035 lin. ft.
Topsoil	11,000 sq. yds.
Railroad Track Construction	Lump sum

Performance of the contract shall begin promptly after execution of the contract and shall be completed on or before July 1, 1951.

Monthly payments will be made for ninety (90) per cent of the construction completed each month.

Bidders must submit proposals upon forms furnished by the Department.

Each proposal must be accompanied by an acceptable surety bond or certified check for a sum equal to at least ten (10) per cent of the total amount of the proposal.

The Contract will be awarded or proposals rejected within thirty (30) days from the date of opening proposals. The right is reserved to reject any or all bids.

The Plans and Specifications and other contract documents may be examined at the office of the Director, Delaware Crossing Division, and at the office of the Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, N. Y. One complete set of the Plans and two copies of the Specifications for this contract may be obtained from the Engineers upon payment of $15.00. Any prospectvie bidder who has made such a deposit may secure extra blueprint copies of the Plans upon payment of 50 cents per drawing, and extra copies of the Specifications upon payment of $3.00 per copy.

State Highway Department
By: J. Gordon Smith, Chairman
W. A. McWilliams, Director
Delaware Crossing Division
Wilmington, Delaware
March 5, 1951

Bids: March 29, 1951

Plumbing, Heating and Electrical Work in Connection with Refuse and Sewage Sludge Incinerator and Sewage Treatment Plant and Pumping Station

Municipal Authority of the Town of Bloomsburg, Columbia County, Pennsylvania

Sealed proposals will be received at the Council Chamber, Town Hall, Bloomsburg, Pennsylvania, until 2:00 P.M., E.S.T., March 29, 1951, for furnishing all necessary labor materials and equipment, and performing all PLUMBING, HEATING AND ELECTRICAL WORK in connection with the construction of a SEWAGE TREATMENT PLANT, PUMPING STATION AND SEWERS and a REFUSE AND SEWAGE SLUDGE INCINERATOR AND APPURTENANCES, and will there be publicly opened and read at that time. Separate proposals will be received upon three parts of each division of the project as follows:

Refuse and Sewage Sludge Incinerator
- Contract One-A Plumbing Work
- Contract One-B Heating Work
- Contract One-C Electrical Work

Sewage Treatment Plant, Pumping Station and Sewers
- Contract Two-A Plumbing Work
- Contract Two-B Heating Work
- Contract Two-C Electrical Work

Proposals shall be accompanied by certified checks or satisfactory bidder's bonds in accordance with provisions contained in the Specifications and in amount not less than five (5) per cent of the bid total.

Copies of the Contract Documents, including Plans and Specifications, may be seen at the office of Gannett Fleming Corddry and Carpenter, Inc., 600 North Second Street, Harrisburg, Penna., or at the office of the Authority Secretary Paul Jacobs, Town Hall, Bloomsburg, Pennsylvania; or they may be obtained from the first of the above places upon deposit of $10.00 for each set.

Full refund will be made to actual bidders for return of one set in good condition within ten (10) days after closing date for receipt of bids; refund for return of all other sets, in good condition within the same periods, will be fifty (50) per cent of the deposit.

Municipal Authority of the Town of Bloomsburg, Pennsylvania
Gannett Fleming Corddry & Carpenter, Inc., Engrs.
600 North Second Street
Harrisburg, Pennsylvania

Bids: March 29, 1951

The Delaware Memorial Bridge Contract 8—Field Painting

Sealed proposals for Field Painting of all steel and other metalwork except the main cables and suspenders for "The Delaware Memorial Bridge" over the Delaware River near Wilmington, Delaware, will be received by the Delaware State Highway Department at the office of the Director, Delaware Crossing Division, Continental American Building, Wilmington, Delaware, until 12 o'clock Noon, Eastern Standard Time, March 29, 1951, at which time and place said proposals will be publicly opened and read.

Alternate bids will be received as follows:

Field Painting Metalwork—Three Coats, Lump Sum.

Alternate A—Field Painting Metalwork—Two Coats, Lump Sum.

The approximate tonnage of steelwork to receive field coats of paint is 31,900 tons.

Performance of the contract shall begin promptly after execution of the contract and shall be completed on or before November 1, 1951.

Monthly payments will be made for ninety (90) per cent of the painting completed each month.

Bidders must submit proposals upon forms furnished by the Department.

Each proposal must be accompanied by an acceptable surety bond or certified check for a sum equal to at least ten (10) per cent of the total amount of the proposal.

The Contract will be awarded or proposals rejected within thirty (30) days from the date of opening proposals. The right is reserved to reject any or all bids.

The Specifications and other contract documents may be examined at the office of the Director, Delaware Crossing Division and at the office of the Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, New York. Two copies of the Specifications may be obtained from the Engineers after March 2, 1951 upon payment of $10.00. Any prospective bidder who has made such a deposit may secure blueprint copies of any reference drawings upon payment of 50 cents per drawing and extra copies of the Specifications upon payment of $2.50 per copy. Such payments will not be refunded and contract documents and drawings are not required to be returned.

State Highway Department
J. Gordon Smith, Chairman
W. A. McWilliams, Director
Delaware Crossing Division
Wilmington, Delaware
February 23, 1951

OFFICIAL PROPOSALS

Bids: March 26, 1951

New Police Building—Toll Houses—Paving

THE DELAWARE RIVER JOINT COMMISSION
CAMDEN, N. J.

Sealed bids will be received for the following work at the office of the Secretary of The Delaware River Joint Commission, Administration Building, Bridge Plaza, Camden, New Jersey until 1:30 P. M. Eastern Standard Time, Monday, March 26, 1951 and then and there will be publicly opened and read.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for these contracts, which may be obtained upon a deposit of ten dollars ($10.00) each and which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty (30) days after the opening of bids.

Each proposal must be accompanied by a certified or cashiers' check, payable to The Delaware River Joint Commission in the amount specified below:

CONSTRUCTION OF A NEW POLICE BUILDING
N. E. Corner, Linden and Sixth Streets, Camden, N. J.

Contract 10-A General Construction Work	$20,000
Contract 10-B Structural Steel and Iron Work	2,000
Contract 10-C Plumbing	2,000
Contract 10-D Heating	2,000
Contract 10-E Electrical Work	2,000

CONSTRUCTION OF NEW TOLL HOUSES
Bridge Plaza, Camden, N. J.

Contract No. 13 Rearrangement of Camden Plaza	$25,000
Contract No. 14 Toll Houses	15,000
Contract No. 15 Electrical Work, Plaza & Toll Houses	40,000
Contract No. 16 Heating & Ventilating—Toll Houses	3,000
Contract No. 17 Plumbing Work	2,500

PAVING PHILADELPHIA BRIDGE PLAZA—PORTION OF SUSPENDED SPANS

Contract No. 21F	$10,000

Each check must be drawn upon a National or State Bank or Trust Company having an office either in Philadelphia, Pennsylvania or Camden, New Jersey and must not be enclosed with the sealed bid. The Surety's consent must be shown. The bidder to whom one or more of these contracts is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of one hundred percent (100%) for each contract.

The Commission will afford prospective bidders an opportunity to inspect the site of the work.

The Commission reserves the right to waive any informalities in the bids received; to reject any or all bids; and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Commission to be most advantageous to the public interest.

THE DELAWARE RIVER JOINT COMMISSION
JOSEPH K. COSTELLO, SECRETARY

Bids: March 29, 1951

New Overhead Steel Rolling Doors

THE PORT OF NEW YORK AUTHORITY
CONTRACT O & M-123

Sealed proposals for new Overhead Steel Rolling Doors for New York International Air Port, Jamaica South, N. Y., will be received at the office of the Director of Purchase of The Port of New York Authority, Room 1402, 111 8th Ave., N. Y. 11, until 11 A.M., Thursday, March 29, 1951, at which time and place proposals will be publicly opened and read.

Contract documents may be obtained upon request at the office of the Director of Purchase.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, March 15, 1951.

(Continued on page 79)

READ THE OFFICIAL PROPOSAL COLUMNS OF ENGINEERING NEWS-RECORD THIS WEEK AND EVERY WEEK

U. S. Government
(Continued from page 78)

Office of the District Engineer, Corps of Engineers, U. S. Army, 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota.—Sealed bids, in duplicate, for furnishing all labor and materials and performing all work required for construction of Orwell Dam on Otter Tail River, Minnesota, will be received in this office until 2:00 P.M., C.S.T., 27 March 1951, and then publicly opened. Further information upon application.

UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION. NOTICE IS HEREBY GIVEN that sealed bids on Invitation No. 7038-173 will be received at P. O. Box 280, Reclamation Center, Casper, Wyoming, until 10 a.m., Mountain Standard Time, March 20, 1951, and then publicly opened for furnishing and delivering Structural Steel for Temporary Powder River Substation, Kendrick Project, Wyoming.

Copies of the standard forms and of the specifications may be obtained from the following offices of the Bureau of Reclamation: Avery A. Batson, Regional Director, 318 New Customhouse, Denver 2, Colorado; and I. J. Matthews, District Manager, P. O. Box 280, Casper, Wyoming. No charge for copies of the specifications and drawings furnished for bidding purposes; for all others $0.50 per copy not returnable.

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3336) will be received by Bureau of Reclamation, Coulee Dam, Washington, until April 4, 1951, and then publicly opened for furnishing labor and materials and performing all work for the construction of State Highway 10-A, grading and paving of streets and parking areas and construction of drain inlets, sidewalks, curbs, and retaining wall in town of Coulee Dam, Washington. Principal items are approximately: 22,500 cu. yds. of excavation; placing 35,000 sq. yds. of asphaltic-concrete paving; 245 cu. yds. of concrete; constructing 2,200 sq. yds. of concrete sidewalks; constructing 13,000 lin. ft. of curbe; and other work. Time allowed for completion will be 180 days. For particulars, address Bureau of Reclamation, Coulee Dam, Washington; or Building 1-A, Denver Federal Center, Denver, Colorado.

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3337) will be received by Bureau of Reclamation, Klamath Falls, Oregon, until April 4, 1951, and then publicly opened for furnishing labor and materials and performing all work for the construction of earthwork and structures, Lower Lost River channel improvement, Station 116 to Station 397 and North Main Dike, Station 4 to Station 315, Tule Lake sump and N Canal banks and pumping plant No. 5 outlet, Modoc Unit, Klamath Project, Oregon-California. The work is situated at Tulelake, California. Principal items are approximately: 656,000 cu. yds., excavation; 161,000 mf. cu. yds., overhaul; and other work. The work is divided into 3 schedules. Time allowed for completion will be 530 days. For particulars, address Bureau of Reclamation, Klamath Falls, Oregon; or Building 1-A, Denver Federal Center, Denver, Colorado.

OFFICIAL PROPOSALS

Bids: April 3, 1951

Collecting Sewer System

Sealed bids will be received by the Commission of Jefferson County, 210 Court House, Birmingham 3, Alabama, at 10:00 A.M., C.S.T., Tuesday, April 3, 1951, and at that time publicly opened and read, for furnishing the pipe and for constructing a collecting sewer system consisting of approximately 16.9 miles of sewers from 8" to 120" in diameter, and which is subdivided into the following contracts.

CONTRACT A—The work under this contract is divided into four sections. Bidders may submit proposals on any or all sections of the work. The description of the extent of the work under each section is shown below.

Contract A-1 Comprising the lower section of Village Creek Collector, extending from sta. 39+30 on the survey line to sta. 184+04.5 just west of St. Marks Village, and consisting of:
- 5,355 ft. 10'-0" sewer
- 8,995 ft. 3'-0" sewer
- Village Creek siphon of 260 ft. of 5'-0" and of 7'-6" sewer
- 100 ft. 5'-0" siphon bypass
- Connection to Valley Creek Diversion line
- 2 transition sections
- 3 intercepting connections to present sewers including approximately 425 ft. of 18" sewer pipe and 15 ft. of 8" pipe
- All miscellaneous construction

Contract A-2 Comprising the middle section of Village Creek Collector, extending from sta. 184+04.5 to sta. 405+06 near the intersection of Tombigbee St. and 40th St. North, and consisting of:
- 6,930 ft. 5'-9" sewer
- 7,695 ft. 5'-3" sewer
- 7,485 ft. 5'-0" sewer
- 3,145 ft. 4'-9" sewer
- 200 ft. 5'-9" bypass sewer
- 4 transition sections
- 27 intercepting connections to present sewers including approximately 150 ft. of 18" sewer pipe, 335 ft. of 12" pipe, 50 ft. of 10" and 2,320 ft. of 8" pipe
- All miscellaneous construction

Contract A-3 Comprising the upper section of Village Creek Collector from sta. 405+06 to sta. 778+32, near Five Mile Creek just north of Meadowbrook Estates subdivision, and consisting of:
- 2,645 ft. 4'-4" sewer
- 1,020 ft. 4'-3" sewer
- 8,370 ft. 4'-0" sewer
- 1,485 ft. 3'-6" sewer
- 5,750 ft. 3'-0" sewer
- 4,000 ft. 2'-9" sewer
- 7,700 ft. 2'-6" sewer
- 2,700 ft. 2'-3" sewer
- 1,900 ft. 1'-16" sewer
- 1,020 ft. 12" sewer
- 7 transition sections
- 17 intercepting connections to present sewers including approximately 85 ft. of 18" sewer pipe, 430 ft. of 12" pipe, 715 ft. of 10" pipe and 1300 ft. of 8" pipe
- All miscellaneous construction

Contract A-4 Comprising the Valley Creek division line, extending south along the line of Border Street extended, from a connection with the Village Creek Collector just east of Roberts Field to a connection with the present Valley Creek Collector on the property of the A.C.L. R.R. one block east of Fayette St., and consisting of:
- 7,561 ft. 5'-6" sewer, mainly in tunnel
- All miscellaneous construction

CONTRACT B Furnishing precast reinforced concrete pipe or concrete pressure (centrifugal) pipe for Sections 1, 2 and 3 of Contract A.

The approximate quantities of pipe required for the three Sections of Contract A are as follows: 5,355 lin. ft. 10'-0"; 8,995 lin. ft. 8'-0"; 260 lin. ft. 7'-6"; 7,130 lin. ft. 5'-9"; 7,695 lin. ft. 5'-3"; 7,585 lin. ft. 5'-0"; 3,145 lin. ft. 4'-9"; 2,645 lin. ft. 4'-6"; 1,020 lin. ft. 4'-3"; 8,370 lin. ft. 4'-0"; 1,485 lin. ft. 3'-6"; 5,750 lin. ft. 3'-0"; 4,000 lin. ft. 2'-9"; 7,700 lin. ft. 2'-6"; 2,700 lin. ft. 2'-3".

Plans and Specifications are on file and may be examined at the office of Claude J. Rogers, County Engineer, Room 206, Jefferson County Court House, Birmingham 3, Alabama, J. W. Goodwin Engineering Co., Inc., "Management Engineers," 726 South 29th Street, Birmingham 5, Alabama, and at the office of Polglaze & Basenberg, 812 South 27th Street, Birmingham 5, Alabama; and same may be obtained from the office of Polglaze & Basenberg upon deposit of $35.00 per set. The full amount of deposit will be refunded to persons or firms submitting a bid, and all other deposits will be returned (less $20.00 which is actual cost of documents), upon return of all documents in good condition within five days after the date of opening of bids.

Only proposals submitted by bidders duly licensed as required by Act. No. 297, General Laws of Alabama, approved September 2, 1935, will be considered. The attention of all bidders is called to the provisions of State Law governing "General Contractors" as set forth in Chapter 4 of Title 46 of the 1940 Code of Alabama (Sections 65 to 82, both inclusive.)

All bids must be accompanied by cash, bid bond, or a check certified by a responsible bank, in an amount not less than five per cent (5%) of the aggregate of the proposal; and such deposits shall be attached to the proposals. The payee of such check or the obligee of such bond shall be Commission of Jefferson County. The maximum deposit by any one bidder need not exceed fifty thousand dollars ($50,000.00). The deposit shall be forfeited in case the Contractor fails to enter into Contract with good and sufficient bonds within 10 days after the Contract has been awarded to him.

The successful bidder will be required to furnish through an authorized agent in the State of Alabama a Performance Bond satisfactory to the Commission in the full amount of the Contract, and a Labor and Materials Bond in a sum equal to but not less than one-half (½) of the Contract price.

No bid may be withdrawn after the time for opening bids has passed. The County reserves the right to hold the bids for a period of sixty days after the date of receiving the bids.

The County Commission reserves the right to reject any or all bids or waive any informality in any bid, and to accept any bids considered advantageous to the Commission.

COMMISSION OF JEFFERSON COUNTY
By W. D. Kendrick
President
ATTEST: T. S. Lucius
Chief Clerk

POLGLAZE & BASENBERG, Engineers
812 South 27th Street
Birmingham 5, Alabama

Bids: April 3, 1951

Collecting Sewer System

Sealed bids will be received by the Commission of Jefferson County, Room 206 Courthouse, Birmingham 3, Alabama, at its office until 10:00 A.M., C.S.T., Tuesday, April 3, 1951, and at that time publicly opened and read, for furnishing the pipe and for constructing collecting sewer systems consisting of approximately 4.3 miles of sewers from 8" to 36" in diameter. The work is subdivided into the following contracts.

CONTRACT A—The work under this contract is for the furnishing of materials and construction of the Bessemer Sanitary Sewer Outfall, consisting principally of the following:
- 4941 feet 36" V.C. or Concrete Sewer
- 1798 feet 36" C.I. Sewer
- 300 feet Steel Truss & Piers
- 8 Manholes
- All miscellaneous construction

CONTRACT B—Furnishing only the items of Sewer pipe listed under contract A.

CONTRACT C—The work under this contract is for the furnishing of materials and construction of the Homewood Griffin Creek Sanitary Sewer Outfall, consisting principally of the following:
- 3318 feet 12" V.C. or Conc. Sewer
- 2925 feet 18" V.C. or Conc. Sewer
- 3714 feet 24" V.C. or Conc. Sewer
- 4497 feet 27" V.C. or Conc. Sewer
- 597 feet 30" V.C. or Conc. Sewer
- 600 feet 12" C.I. Sewer
- 132 feet 18" C. I. Sewer
- 414 feet 24" C.I. Sewer
- 70 Manholes
- All miscellaneous construction.

CONTRACT D—Furnishing only the items of Sewer pipe listed under contract D.

Plans, specifications and contract documents are open to public inspection at the office of C. J. Rogers, County Engineer, Room 206, Courthouse, and at the offices of J. W. Goodwin Engineering Co., Inc., 726 South 29th Street, Birmingham, Alabama, or may be obtained from J. W. Goodwin Engineering Co., Inc., upon deposit of $25.00. The full amount of deposit for one set of documents will be refunded (with deductions not exceeding the actual cost of the documents) upon return of all documents in good condition within three (3) days after the date of opening of bids.

A Performance Bond will be required of the successful bidder in the amount of 100% of contract price. A Labor and Material Bond will be required of the successful bidder in the amount of 50% of the contract price.

Attention of Bidders is called to the License required by Act. No. 297 of General Laws of the Legislature of Alabama, approved September 2, 1935, entitled "An Act to Regulate the Licensing of General Contractors", and that it will be necessary for all persons submitting bids for work involving Ten Thousand Dollars or more to show satisfactory evidence of license as a general contractor. No Plans, specifications or proposal forms herein will be issued to other than licensed general contractors or their authorized agents.

Bids must be accompanied by a certified check or Bidder's Bond in an amount not less than five (5) percent of the base bid.

No bid may be withdrawn after the scheduled closing time for the receipt of bids for a period of sixty days.

The Owner reserves the right to reject any and all bids, and to waive informalities.

JEFFERSON COUNTY COMMISSION
By: W. D. Kendrick, President
Attest: T. S. Lucius, Chief Clerk

J. W. GOODWIN ENGINEERING CO., INC.
726 South 29th Street
Birmingham, Alabama

(Continued on page 80)

OFFICIAL PROPOSALS
(Continued from page 79)

Bids: March 21, 1951

State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on Wednesday, March 21, 1951 by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract is indicated below. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 3				
		Wm. Robinson, Dist. Engr., 301 E. Water Street, Syracuse, N. Y.				
Cortland	FAS851-1	Virgil-Messengerville, Pt. 3 Proj. No. S-820(4)	0.99	Bit. Mac. Opt. Rd. Mix 3 Sp. Alpha I-Beam 2 at 93' 10" & 1 at 94' 4" Alpha Royalty = $208.50	$21,000 Plans $10	$388,000
		DISTRICT No. 4				
		A. R. Mulligan, Dist. Engr., Barge Canal Terminal, Rochester, N. Y.				
Monroe	L05P51-1P	Lake Ontario State (Pkwy.)	5.65	Asp. Conc. Ty. 1A, Opt. =	$42,000	$776,000
	L05P51-2	Parkway, Sect. B (Serv. Rds.)	1.12	5.65 mi. Bot. Crse. Bit. Mac. Pen. = 1.12 mi.	Plans $25	
Monroe	FAS851-2	Archer Road (Co. Rd.) (Black Creek Br.) Proj. S357(1)	0.05	Misc. Work 2 Sp. I-Beam 51' 11½" Ea.	$7,000 Plans $10	$133,000
		DISTRICT No. 7				
		R. F. Hall, Dist. Engr., 444 VanDuzee Street, Watertown, N. Y.				
Lewis	FAS851-4	Indian River-Remington Corners, Co. Rd. Proj. S337(1)	10.68	Triple Surf. Treatment, Rob Gravel 40.12' I-Beam	$34,000 Plans $50	$585,000
		DISTRICT No. 8				
		J. S. Bixby, Dist. Engr., Pleasant Valley Road, Poughkeepsie, N. Y.				
Columbia	FAS851-5	Manorton-Lake Taghkanic Pt. 2, Co. Rd. 49 Proj. S234(3)	2.85	Bit. Treat. Grav. = 2.80 mi. Misc. Work = 0.05 mi. 26.6' Reinf. Conc. Slab	$12,000 Plans $15	$224,000
Orange	FAS851-7	Pine Island-N. J. State Line Co. Rd. 26 Proj. S307(1)	0.26	36' 6½" I-Beam Asph. Conc. Ty. 1A, Opt. Alpha Deck Plate Girder 110' Alpha Royalty = $125.20	$10,000 Plans $10	$175,000
Orange	FAS851-3	Scotchtown-Collabar, Co. Rd. 47 Proj. S308(1)	4.53	Bit. Mac. Pen. Method, Type I	$13,000 Plans $15	$238,000
Ulster	FAS851-8	New Paltz-Minnewaska, Co. Rd. 117 Proj. S313(1)	4.56	Asph. Conc. Ty. 1A, Opt.	$18,000 Plans $15	$319,000
		DISTRICT No. 9				
		F. W. Donovan, Dist. Engr., 71 Frederick Street, Binghamton, N. Y.				
Chenango	FASSH51-1 FASSH151-2P	Bainbridge-Masonville, Pt. 1A Bainbridge-Masonville, Pt. 1 FAS SH50-15 Proj. S273(2)	0.57	Asph. Conc. Ty. 1A, Opt. Cantilever Deck Girder (Alpha) 3 Spans, 2 at 155' & 1 at 190' Alpha Royalty = $495.30	$40,000 Plans $15	$693,000
		DISTRICT No. 10				
		J. J. Darcy, Dist. Engr., Montauk Hwy. at Little E. Neck Road, Babylon, L. I., N. Y.				
Bronx	FACBE51-1	Cross Bronx Expressway, Contract 1B Proj. U1084(11)	1.23	Demolition of Bldgs.	$9,500 Plans $10	$173,000
Suffolk	RC51-3	Amityville Village: Broadway S. H. 1633 Amityville Village, S. H. 5300	0.68	Asph. Conc. Ty. 1A, Opt. = 0.47 mi. Misc. Work = 0.21 mi.	$7,000 Plans $10	$128,000

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of "State of New York, Commissioner of Taxation & Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders". When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
Supt. of Public Works

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3334) will be received by Bureau of Reclamation, Coulee Damm, Washington, until April 3, 1951, and then publicly opened for furnishing labor and materials and performing all work for the installation of heating and ventilating system, Units R1 to R9, Right powerhouse, and supplemental and miscellaneous ventilating systems, Left powerhouse, Grand Coulee Power Plant. Principal items are approximately: furnishing and installing 35,500 sq. ft. of sheet metal duct-work; 1,200 lbs. of heating cabinets; 123 thermostats; and installing 21,000 lbs. of fans; 12,000 lbs. of grilles, registers, and dampers; 20,000 lbs. miscellaneous metalwork; 12,000 lbs. of air duct heaters and heating cabinets; 1,000 ft. of conduit; 12,000 ft. of insulated electrical conductor; and other work. Time allowed for completion will be 100 days. For particulars, address Bureau of Reclamation, Coulee Dam, Washington; or Building I-A, Denver Federal Center, Denver, Colorado.

U. S. Government

Department of Commerce, Bureau of Public Roads, February 27, 1951. SEALED BIDS will be received at the office of the Bureau of Public Roads, Gatlinburg, Tennessee, until 1:30 p.m., E.S.T., MARCH 30, 1951, for the construction of Project 1A11-2A4, Great Smoky Mountains National Park, Sevier County, Tennessee, and Swain County, North Carolina. 12.487 miles paving and other work on Newfound Gap Road from Cole Creek to Newfound Gap, and on Clingmans Dome Road. The approximate quantity of the principal item is 20,600 tons Type I-1 Hot Asphalt Concrete Pavement. Minimum wage rates have been fixed as required by law. For plans and specifications, a deposit of $10 cash or CERTIFIED check will be required to insure their return within 15 days after opening of bids. Plans, specifications and proposal forms may be obtained from the office of the Division Engineer, 1440 Columbia Pike, Arlington, Virginia, or from the address given above. H. J. Spelman, Division Engineer.

OFFICIAL PROPOSALS

Bids: March 27, 1951 (353)

Electrical Equipment

CONTRACT 426

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M., Eastern Standard Time, on Tuesday, March 27, 1951, for Contract 426, for furnishing, installing and testing electrical equipment and conductors and for installing and testing substation equipment furnished by The City and for testing electrical equipment installed under previous contracts, for the sewage treatment plant and for the North Street and Neversink pumping stations which are being built under Contract 381 by The City of New York in the City of Port Jervis, Orange county, New York, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of the City of New York, in the amount of two thousand dollars ($2000.00), for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained at the office of the Chief Engineer, Room 1311, at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, RUFUS E. McGAHEN, JAMES J. MORAN, Commissioners, Board of Water Supply; RICHARD H. BURKE, Secretary.

Bids: March 27, 1951

Sanitary Trunk Line Sewer

Sealed proposals will be received by the City of Stamford, Connecticut at the Office of the Purchasing Agent, Room 1, City Hall, until 2 P.M., E.S.T., Tuesday, March 27, 1951 and then publicly opened and read for furnishing of all plant, labor, materials and equipment and performing all work required for the construction of the following sewers.

Description.

This contract is for the construction of a Trunk Line Sanitary Sewer in the following streets: Canal Street, Atlantic Square, Main Street, Washington Avenue, Woodside Street, Atlantic Street and a Stormwater Sewer in Quintard Place.

Extra strength, full inside diameter, vitrified tile pipe will be required in the following approximate lengths: 36"—4666 Lin. Ft., 30"—508 Lin. Ft., 24"—508 Lin. Ft., 18"—696 Lin. Ft., and 360 Lin. Ft. of 18" extra heavy reinforced Concrete Culvert Pipe, 492 Vert. Ft. of Manhole, replacement of Pavements and all other appurtenant work thereto.

Each Bid must be accompanied with a certified check of the bidder made payable to the City of Stamford or a Bid Bond in an amount not less than 5% of his bid.

Plans and Specifications may be secured at the office of the Purchasing Agent upon the deposit of $25.00 per set, the deposit will be remitted if the Plans and Specifications are returned in good condition not later than 30 days after the opening of the bids.

Additional information may be obtained at the office of the City Engineer, Room 27, City Hall. All Bids will be subject to Section 484.3 of the Charter of the City of Stamford.

WILLIAM P. HEMMING,
Purchasing Agent

U. S. Government

Office of the District Engineer, Corps of Engineers, U. S. Army, 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota.—Sealed bids, in duplicate, for furnishing all labor and materials and performing all work required for New Bridge Construction and Pier Encasement on Existing Bridges, Clearwater River, Minnesota, will be received in this office until 2:00 P.M., C.S.T., 21 March 1951, and then publicly opened. Further information upon application.

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

WANTED

General Contractors' Chief Engineer—Estimator by long-established well-known firm doing a large volume of Heavy Engineering and Industrial Construction, Pittsburgh area. Desired qualifications are: Graduate engineer approximately 40-45, who is experienced in estimating prices as well as quantities, including ability to select best methods of construction, bridges, pile driving and allied work. Must be able to handle the usual design problems of such contracting. Reply must give outline of experience in duties as outlined above, preferably with photograph and salary data.

P-9185, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

Structural Designers and Detailers

with at least three years experience wanted by well-established steel plant engineering and contracting firm specializing in constructing open hearth furnaces. Apply by mail.

LOFTUS ENGINEERING CORP.
610 Smithfield Street Pittsburgh 22, Penna.

DESIGNERS, DRAFTSMEN, ELECTRICAL - MECHANICAL - STRUCTURAL. JOB LOCATED IN MIDDLE WEST. EXCELLENT WORKING CONDITIONS. GOOD SALARY. OLD ESTABLISHED COMPANY.

P-9011, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

ELECTRICAL ENGR-ESTIMATOR

For large electrical contractor. Heavy power and industrial experience essential. Salary commensurate with ability. Write:

Broadway Maintenance Corp.
22 - 09 Bridge Plaza North,
Long Island City 1, New York
Att: Electrical Construction Div.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

CIVIL SERVICE

WANTED, ENGINEER, Structural or Mechanical to advise in preparation of plans, review drawings, supervise and inspect construction, etc. State experience, age and salary required. Address the Commissioner, Tennessee Department of Public Health, 420-6th Avenue North, Nashville, Tennessee.

CIVIL ENGINEERS Wanted—Senior Civil and Assistant Civil Engineers wanted with experience in Municipal and Public Works Engineering—Civil Service—apply or send record of education and experience to City Clerk, City Hall, Royal Oak, Michigan.

POSITIONS VACANT

ENGINEERS WANTED for industrial fire prevention field work by national insurance organization with offices in most major cities. These are permanent jobs with a real future, but candidates should appreciate that extensive away-from-home travel is involved. Age 26-40 preferred. P-8306, Engineering News-Record.

WANTED: STRUCTURAL Engineers, Mechanical Engineers and Industrial Architects; some defense work. Seelye, Stevenson & Value, 101 Park Avenue, New York, N. Y.

WANTED: ASSISTANT Crushed Rock Superintendent. Only experienced personnel need apply. Salary open. L. G. Everist, Inc., Sioux Falls, South Dakota.

(Continued on page 82)

ENGINEERS

ELECTRICAL - MECHANICAL - STRUCTURAL

Openings in Ohio and New York offices offering long term employment with good salary for qualified Group Leaders, Designers and Draftsmen experienced in one or more of the following phases of industrial plant design:

Electrical	Power, lighting layouts and electrical controls.
Mechanical	Plant layout, process piping, conveyors, heating and ventilation, boiler houses, process equipment layout, refrigeration, plumbing, tanks and vessels, packaging equipment, special machinery and equipment.
Structural	Structural steel and reinforced concrete.

Please submit complete resume stating experience, education, salary required and availability date.

THE H. K. FERGUSON COMPANY
Engineers and Builders
The Ferguson Bldg. 1783 E. 11th St. Cleveland 14, Ohio
19 Rector Street New York 6, N. Y.

ENGINEERS

Process (Chemical)
Engineers
Construction Engineers
Project (Mechanical)
Engineers

To Work On
Petroleum, Petro-Chemical
and Chemical Projects

Write in complete detail, giving positions held, references, education, salary expected. Personal interview can be arranged.

Address Personnel Department

E. B. BADGER
& SONS COMPANY
75 Pitts St., Boston, Mass.

ENGINEERING

We are increasing our engineering organization for the design of Oil Refinery, Blast Furnace, Open Hearth, Steel Mill, Power Plants and have openings for men who are interested in permanent employment and advancement.

Such men should be qualified as draftsmen, designers, checkers or higher engineering skills on design of piping, instrumentation, pressure vessels, structural steel, concrete, platework, heavy mechanical equipment and electrical.

If you are interested and have engineering design experience on this class of work, write to us furnishing full record of experience and qualifications.

This work is in our Cleveland office, and is on a 5-day, 45-hour week basis, with time and one-half over 40 hrs; also, vacation and holiday pay. Steady employment and a good opportunity with a good organization.

ARTHUR G. McKEE & CO.
2300 Chester Ave.
CLEVELAND 1, OHIO

CITY OF DETROIT

Engineers experienced in the design and construction of water works needed for $38,000,000 project. Starting salary $4,382, $5,204, $5,736, $6,586 per year with annual increases. Submit resume of experience with application request.

DETROIT CIVIL SERVICE COMMISSION
1501 Water Board Building
735 Randolph Street, Detroit 26, Michigan

DESIGN ENGINEERS

Graduate mechanical engineers or equivalent, experienced, for permanent work in plant engineering dept., organic chemical plant. Salary commensurate with experience. Contact personnel superintendent.

Celanese Corporation of America
BOX 148 BISHOP, TEXAS

SERVICE MANAGER

EXPERIENCED
FOR BRANCH OF CATERPILLAR DEALER. OUR EMPLOYEES KNOW OF THIS AD.

P-8984, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

POSITIONS VACANT
(Continued from page 81)

PROJECT ENGINEER and Structure Engineer wanted by reliable contracting firm on canal work in California and Arizona. Prefer engineering graduate with two or more years on construction. P-9107, Engineering News-Record.

BRIDGE DESIGNERS and Structural Draftsmen. Openings for both experienced men and recent graduates. Applicants should furnish complete information. Frank D. McEnteer, Consulting Engineer, Clarksburg, W. Va.

GENERAL SUPERINTENDENT for work in Eastern part of the Country, must be capable of supervising all phases of Highway construction. Reply stating age, experience and references. P-9052, Engineering News-Record.

WANTED: STRUCTURAL Engineers for pulp and paper mill design including mill layout and structural steel and reinforced concrete design. In first letter give complete engineering experience, age, education, etc. Address Construction Engineer, P. O. Box 1844, Savannah, Ga.

DRAFTSMEN: EXPERIENCED in detailing and checking structural steel, steel stairs, miscellaneous and ornamental iron. Must be interested in permanent employment. Good working conditions with group hospitalization, health and accident insurance available. Give education, experience, age, salary desired and date available. The J. T. Edwards Co., 1241 McKinley Avenue, Columbus 8, Ohio.

ENGINEERS WANTED in consulting office, qualified for design on water and sewage treatment projects. Location, Ohio. P-9141 Engineering News-Record.

ENGINEERS—SOILS Engineer and Material Inspectors. College graduates or equivalent training, with basic knowledge of strength of materials. Should be familiar with conventional laboratory and field methods of sampling and testing various types of construction materials. Personnel Director, Washington Suburban Sanitary Commission, Hyattsville, Md.

WANTED: CIVIL Engineer having thorough knowledge and experience in development, construction, maintenance and management of Public Housing Projects. Must be familiar with preparation of preliminary plans and program submittals and to act as liaison between Regional Public Housing Administration, Local Housing Authority, Architects and contractors. New development program expected to last several years. Permanent position in the maintenance of entire local program. Southeastern State. Submit resume of qualifications and salary wanted with application. ALSO: A construction Engineer as Clerk of the Works or Chief Inspector for above new development program. Submit resume of qualifications and salary wanted with application. Address P-9178, Engineering News-Record.

SELLING OPPORTUNITY OFFERED

WHOLESALING BUILDING supply company has an opening for Sales Manager of Engineering Products Division. Duties are estimating and selling bar joist, roof deck, sash, etc. Attractive salary, monthly bonus and profit sharing plan. We desire a man thoroughly familiar with building products and with sales ability. All replies will be treated confidentially. State age, experience and present salary. SW-9152, Engineering News-Record.

POSITIONS WANTED

CHIEF STRUCTURAL. Project Engineer, M.S.C.E. degree, registered, 20 years experience design & construction hydro-electric dams, locks, buildings, chemical plants, desires position of responsibility. PW-9008, Engineering News-Record.

SUPERINTENDENT — WIDELY Experienced all forms of pressure grouting, dams and foundations, water-proofing. All forms stabilization work, structure solidification, cast-in place piping, etc. Desires permanent connection with progressive firm, ten years with present employer but desire to make change. Moderate salary or will consider profit sharing proposition. Competent Estimator, 44 years old, married, go anywhere. No boozer. PW-9028, Engineering News-Record.

SUPERINTENDENT CONSTRUCTION 22 years experience grading and concrete paving, some asphalt. Go anywhere. PW-9120, Engineering News-Record.

SALARIED POSITIONS $3,500—$35,000

We offer the original personal employment service (established 41 years.) Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars.

R. W. BIXBY, Inc., 272 Dun Bldg., Buffalo 2, N.Y.

POSITIONS WANTED

CONSTRUCTION SUPERINTENDENT available soon. Age 40. Good health. Energetic. Specialist concrete and wooden structures. Twenty years varied experience heavy construction; cofferdams; sewers; dams; bridges; army camps; defense plants; more recently large housing projects. Southeastern U. S. or Caribbean area preferred. Allen McSherry, P. O. Box 2108, Miami, Fla. Phone 89-1686.

CIVIL, SANITARY Engineer: M. ASCE.; Registered P.E.; Advanced degrees in engineering; Twenty years construction, engineering and engineering teaching experience. Highway, bridges, buildings, sewers and sanitary installations. Administrative and business experience, PW-9098, Engineering News-Record.

CIVIL ENGINEER, College graduate, age 44, P.E. license in six states, 22 years on construction of highways, bridges, sewers, buildings, utility valuation, last 14 years on steam power plants as Project Engineer. Presently employed, but desires permanent location. Location immaterial. PW-9102, Engineering News-Record.

ELECTRICAL ENGINEER — Industrial and utility construction estimator, superintendent and designer. Age 33; married; registered. Write PW-9114, Engineering News-Record.

SANITARY ENGINEER—Complete charge of preliminary investigations, surveys, design, preparation of contract drawings and specifications, reports, estimates. Twenty-five years experience sewage treatment, water filtration, sewer and water systems. Available April first. PW-9147, Engineering News-Record.

AVAILABLE. SUPERINTENDENT Dirt-Grading and Concrete paving. Piercey, 621 N. Madison, Dallas, Texas.

YOUNG AGGRESSIVE construction Engineer. Experience in field supervision, layout, cost, and purchasing. Desires employment in Ohio or Michigan. Not eligible for draft. PW-9142, Engineering News-Record.

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Brownhoist 1-yd. gas shovel and crane.
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Lorain 40 Hi-Lift shovel attachment.
Bucyrus-Erie 1½-yd. rock bucket.
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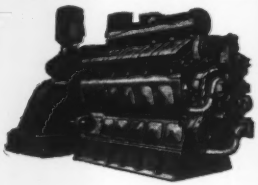

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1250	General Motors	16-278A	1600	720	312	General Motors	8-268A	450	1200
937.5	General Motors	12-567	1080	720	312	Clark	MD-4	375	327
625	Alco	6-12½x13T	750	600	125	General Motors	3-268A	150	1200
425	Baldwin	VO-6	510	450	75	General Motors	4046C	90	1200
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Rotary air-blast drill permits continuous cuts

Features of large-size blast-hole drill include: Drills dry; uses a tri-cone roller-type bit; and hole is kept clean by compressed air

Designed for all types of heavy-duty excavation work, the Joy Champion utilizes continuous pressure cutting to achieve high production. The tri-cone roller bit employed has three cones that are free to rotate (under pressure) against the bottom of the hole. These bits are available with various tooth designs for use in rock of different hardness. Speed of cut is regulated by controllable hydraulic pressure.

Cuttings are blown away from the face of the bit by compressed air. Volume and pressure of air are sufficient to force the cuttings up around the collar of the hole where they are picked up by a dust collector. The large volume of air flowing over the bit also serves to keep it cool-running. Rigid drill stem, controlled feed-pressure and controlled rotation speed combine to prevent bit wander.

The Champion has a semi-automatic device to re-chuck the drill pipe after each 4-ft advance of the bit. A single control lever releases the chuck at the bottom of the feed travel, and after being raised automatically to the top of its stroke, the chuck then automatically grips the square drill pipe by a simple movement of the lever.

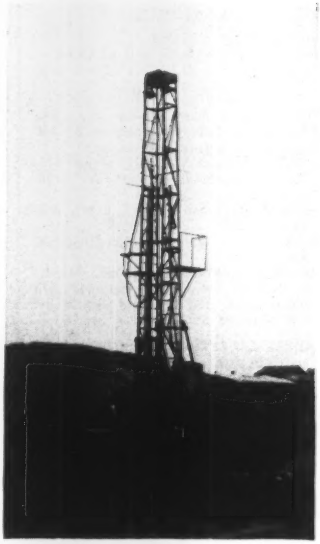
The integral derrick is raised and lowered hydraulically. Standard mast is 30 ft long, and will handle 20 ft lengths of drill pipe when hoisting and stacking. A 40-ft unit which will handle 30-ft drill pipe lengths is also available.

Typical job figures include: 1½ ft per hr is dense, hard dolomite; 50 ft per hr of 6-in. hole at a limestone quarry; 480 ft per day at a coal strip mine, with bit life exceeding 8,000 ft per bit; and 350 ft per shift drilling through silt, mud, clay, shale, sandstone, limestone, and slate.

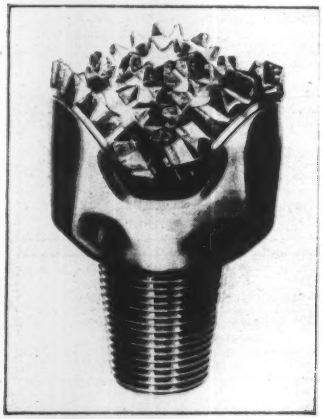
The Champion is available in two models: The Heavyweight (Class 58-BH) is rated for 7⅞-in. holes; the Middleweight (Class 56-BH) is rated for 6¼-in. holes. Either electric motors or diesel engines are available as power units. One power source drives the drilling mechanism, the tramming mechanism, and the hydraulic pump. Standard crawler treads are 16-in. wide, but 32 in. treads are now available.

The Heavyweight has three hydraulic leveling jacks which have a 49-in. stroke; the Middleweight has two screw-type jacks with a 30-in. stroke. Traction speed of the large model is 1 to 5 mph; of the smaller unit, 1 to 7 mph. Weight of the Heavyweight ranges from 46,000 to 50,000 lb. Its dimensions are: Height, mast horizontal, 13 ft 3 in.; length, mast elevated, 27 ft; and width, jacks and dust collector in place, 11 ft 6 in. —Joy Mfg. Co., Henry W. Oliver Bldg., Pittsburgh 22, Pa.

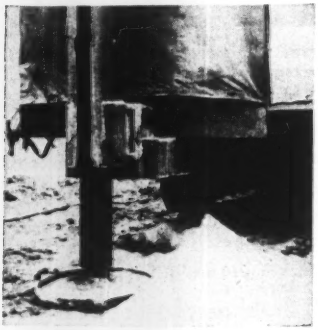
(*more New Products on page 94*)



Large drill handles heavy-duty operations



Roller-type bit has three cutting cones

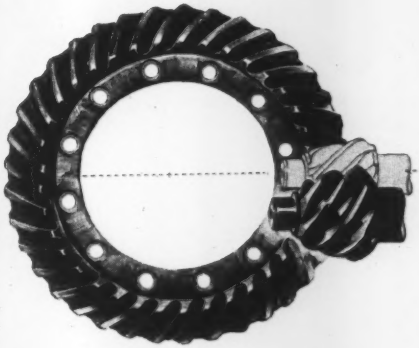


Jacks simplify leveling-up operations

Semi-automatic chuck is quickly re-set

Chuck at bottom of 4-ft advance of bit

WHO makes HYPOID GEARING makes a difference!



TIMKEN-DETROIT

Is The One Truck Axle Manufacturer With Years of Hypoid Experience and Know-How!

The Timken-Detroit Axle Company was the first manufacturer of heavy-duty truck axles to realize that the inherent greater torque capacity of hypoid gears is advantageous in heavy-duty rear axles. In 1944, after several years of development work, the first rear axle for heavy-duty motor trucks equipped with hypoid gears was placed in production. Since that time, millions of ton miles of testing under all conditions in actual service, plus exhaustive laboratory testing, has *proved* the cost-saving ruggedness and durability of Hypoid Gearing.

Early in 1947, The Timken-Detroit Axle Company placed in regular production a complete series of Hypoid-equipped "3 for 1" rear axles for trucks of 15,000 to 28,000 G. V. W., with engines developing from 100 to 300 horsepower. In this series of "3 for 1" axles, hypoid gears are used for single-reduction final drives, and for the first gear reduction in single-speed and two-speed double-reduction final drives.

Today, Timken-Detroit offers a complete range of capacities—a hypoid rear axle for each size of pneumatic tires—with the correct type of final drive and gear ratio for the job to be done.

WRITE FOR FREE ILLUSTRATED BOOKLET!

TIMKEN Detroit AXLES

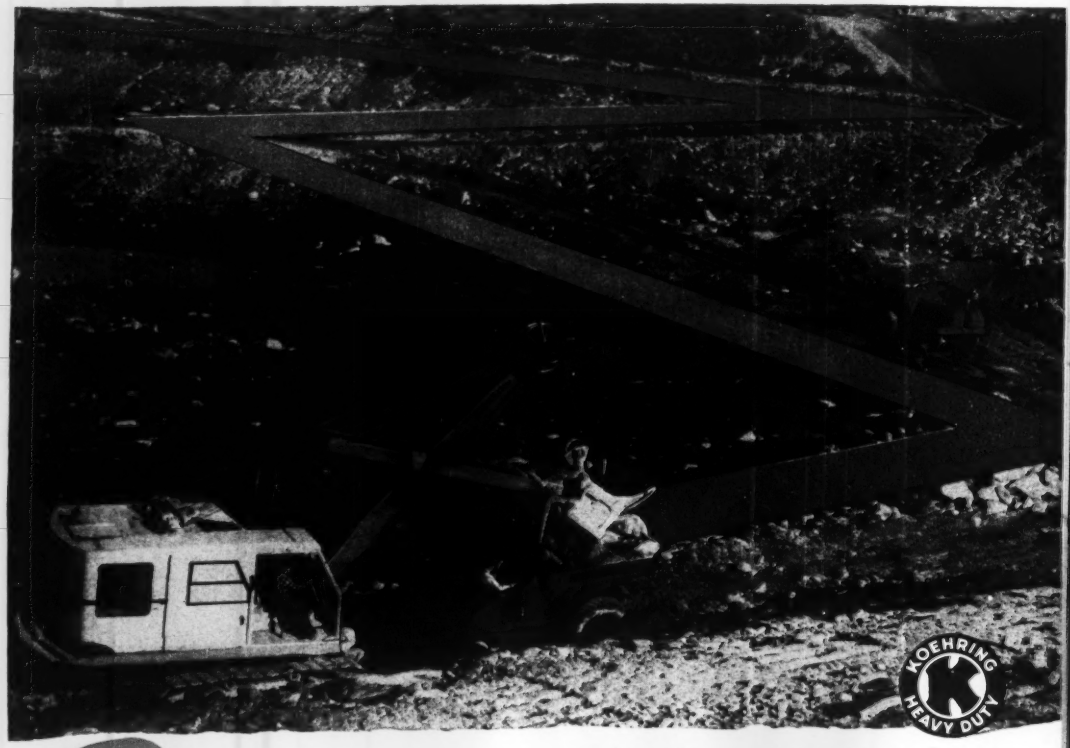
A PRODUCT OF THE TIMKEN-DETROIT AXLE COMPANY
DETROIT 32, MICHIGAN

Accepted SAE Standard

TRADE MARK REGISTERED

PLANTS AT: DETROIT AND JACKSON, MICH. • OSHKOSH, WIS. • UTICA, N. Y. • ASHTABULA AND KENTON, OHIO • NEW CASTLE, PA.

NO-TURN shuttle haul.



Dumptors®

SAVE TURN TIME GAIN HAUL TIME

On every haul cycle, Koehring fast-shuttling Dumptors eliminate slow turns — at the loading unit, at the dumping point, on sharp, "zig-zag" grades. They gain *more* productive haul time, because Koehring constant-mesh transmission gives the same 3 fast speeds forward and reverse. Here's how much no-turn shuttle operation can increase your production:

By eliminating only 2 turns on a 1,000' haul, time studies prove that Dumptors can save 30 seconds every round trip, and increase hourly yardage output over 10% per unit. What's more — fast, easy spotting and 1-second gravity dump keep production high.

Remember, too — top hauling efficiency also means increased shovel output. For *double profit protection*, team fast-shuttling Dumptors with Koehring heavy-duty excavators. Four sizes: ½-yd., ¾-yd., 1½-yd., and 2½-yd.

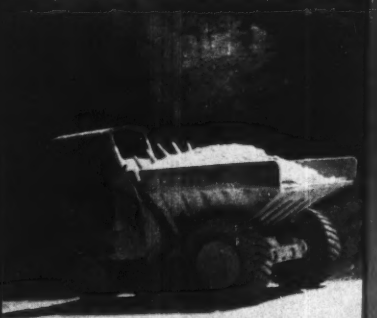
KOEHRING COMPANY
MILWAUKEE 16, WISCONSIN
Subsidiaries: JOHNSON • PARSONS • KWIK-MIX

It will pay you to get complete facts from your Koehring distributor. Call him NOW.

IN OPEN PITS OR UNDERGROUND

In confined underground operation, Dumptor spots fast, close to shovel . . . no need to turn. Shovel operator has short swing cycle, a big, easy-to-hit 8' x 8' target, for loading Dumptor over either end or sides.

At dump there's no slow jockeying around. Dumptor drives up, body forward; operator hits body release lever; gravity instantly dumps the 6-yd. payload in 1 second . . . Dumptor heads back without turning.



On no-turn shuttle haul, from underground to surface, loaded Dumptor leaves narrow tunnel in same position as it entered . . . travels same speeds forward and reverse . . . easily climbs 24% grades fully loaded.

9¾-ft.-per-min. Parsons 250 Trenchliner

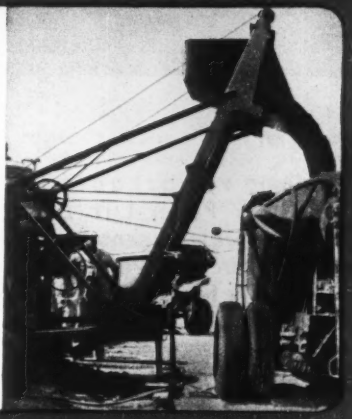
With 30 digging feeds, Parsons 250 Trenchliner produces up to 9¾ feet of clean-cut trench per min. . . . digs 16" to 42" wide, up to 12½ feet deep . . . cuts within 11" of either side. Reversible spoil conveyor shifts through machine by power in less than 1 min. to dump right or left. Constant discharge height speeds loading into trucks. Larger and smaller models are also available . . . contact your Parsons distributor now.

PARSONS *(Koehring Subsidiary)*
Newton, Iowa

9'-1" discharge with Kwik-Mix Tower Loader

This Kwik-Mix Tower Loader fits 11-S and 16-S Dandie® concrete mixers, discharges at 9'-1" into trucks, overhead hoppers, or stockpiles. Bucket holds full batch, is powered by mixer engine and dumps automatically at top of tower. Also available for Kwik-Mix No. 10 and 14 bituminous mixers. Get complete information from your Kwik-Mix distributor, or send for literature on low-cost, time-saving Tower Loader today.

KWIK-MIX *(Koehring Subsidiary)*
Port Washington, Wis.

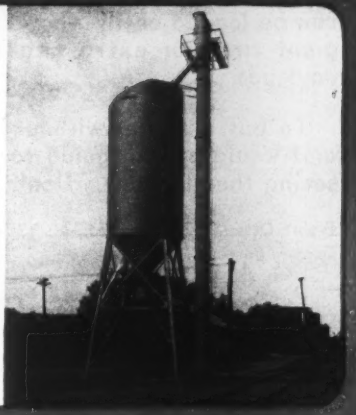


254 to 611-bbl. Johnson Single Silos

In various sizes of 11' and 12' diameters, provide 254, 373, 492, 611-bbl. and larger cement storage. Gasoline or electric-driven screw conveyor and bucket elevator, box-car, truck receiving hoppers or undertrack unloading arrangement, electric bin signals, aeration diffusers, one or two 1000-lb. batchers. Larger batcher, added leg and elevator height available for mix truck charging. Silos are 1-piece, all-welded.

C. S. JOHNSON *(Koehring Subsidiary)*
Champaign, Ill.

W69



big FEATURES IN MINIATURE

..right on your own desk

Literature describing remarkable features of the new ROGERS Power-Lift Detachable Gooseneck Trailer will be sent upon your request; but—more than that—any Rogers Dealer will demonstrate its features, right on your own desk with an *operating scale model.*

Contact him—see how easily it detaches—how the deck can be raised or lowered to avoid unloading and detouring under certain conditions—how disabled, non-powered equipment can be loaded easily—how the design provides giant tires for extra heavy and profitable payloads.

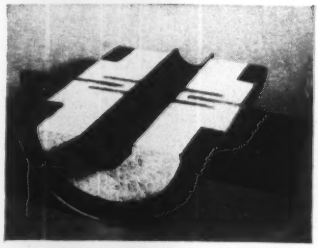
To buy a trailer without seeing this Rogers unit would be like going to the circus without seeing the elephant. Don't do it.

Export Office: 50 Church St., N. Y. 2, N. Y.
Cable Address: "Broscites"

Developed by The Trailer Pioneers

ROGERS BROS. CORP. ALBION PENNA.
135 ORCHARD STREET

(Continued from page 90)



Insulated plate anchor

Designed to isolate piping from underground electrical currents at anchor points, the Durant device uses heavy steel plate to anchor pipe and conduit against longitudinal movement due to pipe expansion or contraction. The plate is held in place between two attached plates, with separation accomplished by Transite asbestos cement sheets—anchor is not in direct contact with the interior piping. This type of anchor is said to also result in reduced thermal losses. It is available in sizes from ½ to 24 in., I.P.S., and in all conduit diameters required.—Durant Insulated Pipe Co., Palo Alto, Calif.

Electric hammer and drill

Combination tool can be used for: Drilling concrete and masonry; drilling metal and wood; and driving, grinding, buffing, and wire wheels. The Wodack Do-All is powered by a universal motor. Weight is 15 lb. Average speed when drilling in concrete is 3½ in./min on a ⅝-in. hole. Drilling range of the hammer is from ¼ to 1⅜ in.—Wodack Electric Tool Corp., 4627 W. Huron St., Chicago 44, Ill.

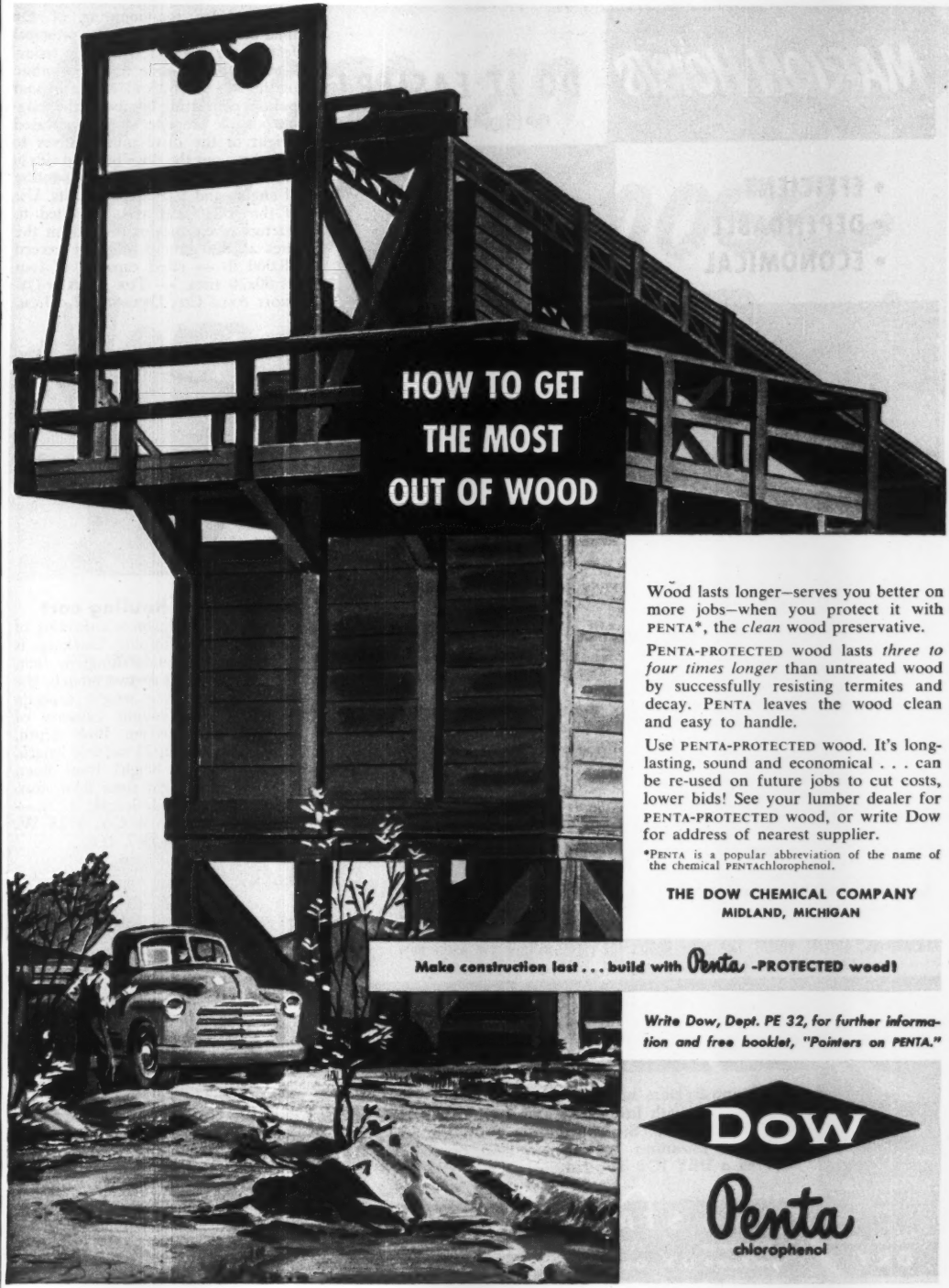
Transfer pump for fluids

High-speed air-operated transfer pump empties a 55-gal drum of SAE 30 oil in slightly over 2 min. The Speed-Flo Model 82230 is rated at 22 gpm. The pump fits all 2-in.-opening drums, and has a built-in regulator to permit finger-tip regulation of the volume of output. Weight is 18 lb.—Lincoln Engineering Co., 5702-20 Natural Bridge Ave., St. Louis 20, Mo.

Double-reduction rear axle

Heavy-duty 2-speed hypoid-helical double-reduction rear axle makes possible the use of powerful engines and transmissions in short-wheelbase truck-tractors. Arrangement of internal gear-

(Continued on page 96)



Wood lasts longer—serves you better on more jobs—when you protect it with PENTA*, the *clean* wood preservative.

PENTA-PROTECTED wood lasts *three to four times longer* than untreated wood by successfully resisting termites and decay. PENTA leaves the wood clean and easy to handle.

Use PENTA-PROTECTED wood. It's long-lasting, sound and economical . . . can be re-used on future jobs to cut costs, lower bids! See your lumber dealer for PENTA-PROTECTED wood, or write Dow for address of nearest supplier.

*PENTA is a popular abbreviation of the name of the chemical PENTAchlorophenol.

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

Make construction last . . . build with Penta -PROTECTED wood!

Write Dow, Dept. PE 32, for further information and free booklet, "Pointers on PENTA."

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MARION HOISTS DO IT EASIER!

... that's why they are more

- EFFICIENT
- DEPENDABLE
- ECONOMICAL

● By use of a curved track in the patented lifting arms, MARION gives you a hoist that operates at a uniform oil pressure throughout its dumping cycle.

Some conventional hoists require a peak oil pressure of 1100 lbs. per sq. in. to do the same job that a comparable MARION hoist, with patented lifting arms, does at only 615 lbs. per sq. in.

Consequently, MARION Hoists actually do their job easier—hydraulic systems last longer, are more efficient and dependable, and, in the long run, more economical to own and operate.

Ask us for the name of your nearest MARION Distributor—let him give you the complete story.

MARION BODIES AND HOISTS

MARION METAL PRODUCTS COMPANY
MARION, OHIO, U.S.A.

STANDARD AND SPECIAL HOISTS AND DUMP BODIES FOR LIGHT, MEDIUM AND HEAVY DUTY SERVICE

Stang WELLPOINT SYSTEM

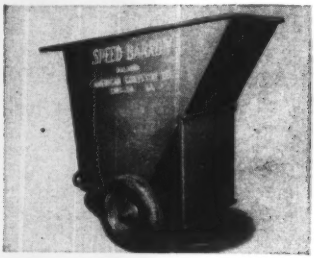
For KNOW-HOW • ENGINEERING • SUPERVISION • EQUIPMENT • to keep jobs DRY

The Stang System has proved its efficiency and economy on both large and small jobs all over the United States. Stang engineering and supervision in planning, installation and operation insures a DRY JOB at all times.

JOHN W STANG CORPORATION

2 Broadway, New York 4, N. Y. — 2123 S. 56th St., Omaha, Nebr. — 8221 Atlantic Ave., P.O. Box 631, Bell, Cal.

ing provides top-mounting of the final drive unit. One of the principal features of the R-330 axles is reduction of the distance from centerline of the axle to the end of the hypoid pinion, permitting the use of the longest possible propeller shaft. Increased height of the drive pinion serves to straighten out the drive line and aids in elimination of angles in the mounting of engine and transmission units. Use of the R-330 rear axle is limited to tractors where maximum load on the tires at the ground will not exceed 18,000 lb — rated capacity of four 11:00x20 tires. — THE TIMKEN-DETROIT AXLE CO., DETROIT 32, MICH.



Three-wheel hauling cart

Speed-Barrow features unloading of material without tipping. Discharge is accomplished by unlatching, by foot, of the gate. Made in two models, the Speed-Barrow has a weight capacity of 1,800 lb; a volume capacity of 12 ft. Dimensions are: Body depth, 36 in.; body width, 21 in.; axle length, over-all, 32 in.; height from floor, front, 48 in.; height from floor, rear, 41 in.; and top body length, 42 in.— AMERICAN CONVEYOR CO., 1115 W. ADAMS ST., CHICAGO 7, ILL.

Tractor winch

Winch for mounting on Caterpillar D4 tractors has an extra-large drum capacity ranging from 3,480 ft of ⅜-in. to 870 ft of ¾-in. cable. Two-piece drum divider flange permits adjustment of barrel length for required cable capacity. End of transmission shaft provides for measuring spool.— HYSTER CO., 2953 N. E. CLACKAMUS, PORTLAND 8, ORE.

Wiring tools

Two new tools to speed remote-control wiring installations are a stapling gun and a wire-guiding reel support. The gun has a controlled mechanism that drives staples to a predetermined depth into joists, studs, beams, or sheathing. Tabs in a specially designed channel keep the wire

(Continued on page 98)

Choose an FWD and you choose More than a Truck

You choose the ability to DO MORE WORK PER YEAR

"When other trucks must stay at home . . . our FWDs are on the job. It pays out the year 'round on hauling . . . maintenance . . . snow and ice control . . . doing a *better* job and with *greater safety* — both on or off the highway."

You choose lower maintenance costs . . . longer truck life

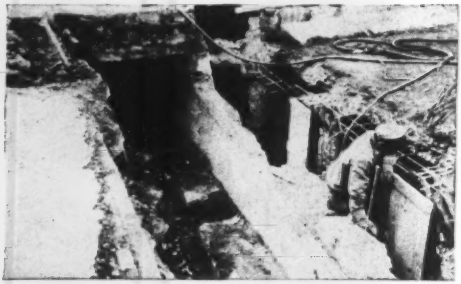
"Our FWDs need fewer repairs because there's less strain . . . both load and power are properly distributed. We've found that an FWD has up to twice the life."

GET FULL FACTS on the entire team of FWDs. Models now range from 14,500 to 60,000 GVW. 4- and 6-wheel drives. Ask for the free FWD Model Book. See your FWD distributor or write FWD.

THE FOUR WHEEL DRIVE AUTO CO., Clintonville, Wis.

Canadian Factory: Kitchener, Ont. *World-Wide Sales and Service*

America's Foremost Heavy-Duty Truck



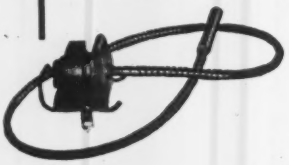
CEMENT GUN CO. RESTORES BRIDGE

Photo above shows the disintegrated condition of an abutment on a reinforced concrete bridge in a large Western Pennsylvania city. Repair work on this structure necessitated an almost complete rebuilding of the abutment. To accomplish this, the end span was jacked up and new expansion plates were placed at the bridge seats. In addition to repair of abutments—beams, girders, and arch ribs were reintegrated with "GUNITE" wherever disintegration had taken place.

This is just one of many typical "GUNITE" repair jobs which have been done by our contract department for Railroads and State Highway Departments throughout the country. For information on "your job" and description of many other "GUNITE" jobs performed by us send details and request catalog A2400—on your letterhead, please.

CEMENT GUN COMPANY
"GUNITE" CONTRACTORS
GENERAL OFFICES—ALLENTOWN, PENNA. U.S.A.
MANUFACTURERS OF THE CEMENT GUN

STOW
Concrete Vibrators are better because:



STOW Vibrators are ruggedly constructed for long, efficient service, deliver up to 7000 vibrations per minute to the mix . . . place even stiff mixes uniformly. The high-speed motors (up to 9500 RPM) are protected by skid mountings. Job-engineered, smooth running STOW FLEXIBLE SHAFTS guarantee longer, trouble-free performance. For better results, always specify STOW Vibrators!

STOW MANUFACTURING CO.
19 Shear St., Binghamton, N. Y.

Diamond Core
Drilling
CORE BORINGS
for Foundations, Dams, Bridges and all Heavy Structures
GROUT HOLES
Tinney Drilling Co.
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DREDGES
HYDRAULIC
● DIPPER ●
CLAMSHELL
Bolted sectional steel hulls for landlocked, inland waters
If you need a dredge, write us!
AMERICAN STEEL DREDGE CO. INC.
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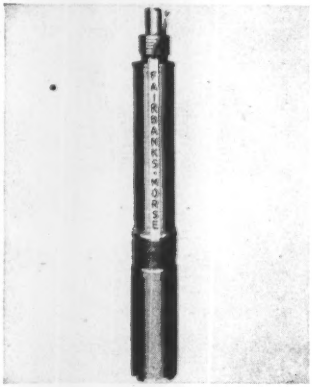
DESIGNERS AND BUILDERS OF DREDGING EQUIPMENT SINCE 1905

flat for neat installation. The support reel permits the wire to pay-off smoothly and quickly without kinks or twists.—General Electric Co., Bridgeport, Conn.



Submersible pump

Water-cooled water-lubricated submersible pump has many features. It is a self-priming deep-well pump installed below water level; it is easy to install by added pipe lengths to the depth of the water; and no jets, rods, or shafts are required. This pump is designed to deliver in excess of 70 ft with well diameters of 4 in. and larger. Motor relay and capacitor are located in a control box above ground.—Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

New Product Briefs

Portable heater for construction jobs and other temporary applications consists of a complete heating unit, including fuel tank, mounted on easy-operating trucks. Units are available in capacities to 300,000 btu's. Made by Prat-Daniel Corp., East Port Chester, Conn.

Haydite blocks have a tinted thermal-setting plastic baked to one side, permitting construction of colored walls without lathing, plastering, painting, or wallpapering. Spectra-Glaze blocks are produced by: Alton Brick Co., St. Louis 8, Mo.

Lightweight, rechargeable battery is 3 in. high, weighs 4.30 oz, and has a 4.50-in. volume. The Silvercel 5HR can be discharged at 5 amps for up to 60 min; maximum discharge is 20 amps. Manufactured by: Yardney Electric Corp., New York 7, N. Y.

A ROOF DECK OF STURDY STEEL

Saves weight!

A roof built with steel roof deck is not only lighter itself, but saves weight in other members. The light weight of Wheeling Tri-Rib Steel Roof Deck reduces dead load *and*—the weight and cost of supporting beams, columns and footings can also be reduced.

Saves time!

Sheets of Tri-Rib Roof Deck are easy to handle, simple to install by either welding or clipping. Spanning up to three purlins with a single length, they permit fast coverage of large areas. This method of construction also means less time lost due to bad weather.

Saves money!

A roof of Tri-Rib is low in cost—usually less than any comparable roof. Further, the reduced cost of supporting structure means added savings. Made of Cop-R-Loy, the Copper Alloyed Steel, Tri-Rib Roof Deck is designed in accordance with specifications adopted by A.I.S.I. for light gauge structures, dated January, 1949.

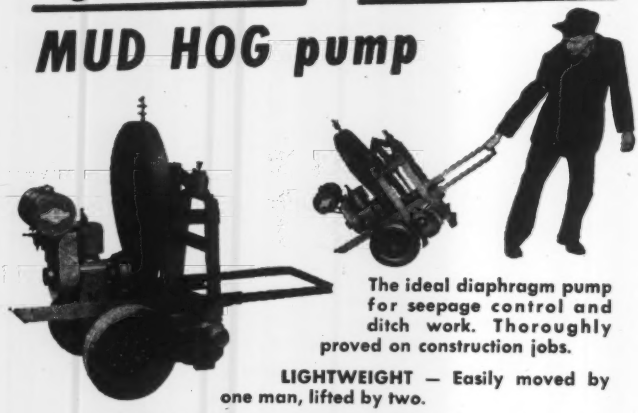
For specifications, consult Sweets' Files, or write us.

Build with Wheeling **Wheeling** *Tri-Rib Steel Roof Deck!*

WHEELING CORRUGATING COMPANY • WHEELING, W. VA.

ATLANTA · BOSTON · BUFFALO · CHICAGO · COLUMBUS · DETROIT · KANSAS CITY
LOUISVILLE · MINNEAPOLIS · NEW ORLEANS · NEW YORK · PHILADELPHIA · RICHMOND · ST. LOUIS

Here is Marlow's NEW lightweight, economical MUD HOG pump



The ideal diaphragm pump for seepage control and ditch work. Thoroughly proved on construction jobs.

LIGHTWEIGHT — Easily moved by one man, lifted by two.

LOW COST — Less than half the cost of other Mud Hogs.

RUGGED — Handles clear or trashy fluids . . . from a gurgle to a gush . . . up to 3,200 GPH. Strongly constructed for long trouble-free service.

OTHER NEW FEATURES — Two self-aligning crank shaft bearings and shaft and bearing failures. Strong, simple power transmission reduces maintenance. Many other outstanding features.

Ask your Marlow distributor or send for complete details on this new money-saving pump.

MARLOW PUMPS
510 Greenwood Ave.
Ridgewood, N. J.
Gentlemen:
Please send me complete information right away on the new Marlow lightweight Mud Hog pumps.
Name .....
Company .....
Address .....

MARLOW PUMPS RIDGEWOOD NEW JERSEY
WORLD'S LARGEST LINE OF CONTRACTORS' PUMPS

MOTT Diamond Core Drilling Contractors

FOUNDATION TESTING
for
Bridges, Dams, Heavy Structures
PRESSURE GROUTING

MFR'S DIAMOND & SHOT CORE DRILLS, GROUT MIXING MACHINES, PACKERS AND GROUT PUMPS

MOTT CORE DRILLING CO.
HUNTINGTON, W. VA.

GUNITE
PNEUMATICALLY PLACED CONCRETE
DENSE · DURABLE · HIGH STRENGTH
for
Restoring Disintegrated Concrete
Dam, Dock and Bridge Repairs
Steel Encasement and Fireproofing
Sewer, Water Pipe and Penstock Linings
Stack and Bunker Linings
Wood Pile Casings—Pressure Grouting
Prestressed Tanks and Silos
Get in touch with us for engineering data and estimates
GUNITE CONSTRUCTION CORPORATION
420 LEXINGTON AVE., NEW YORK 17, N.Y.
MURRAY HILL 3-7699

MANUFACTURERS' PUBLICATIONS

Plaster-bonding Kifs—Kifs, a special device for bonding plaster to concrete, are described in this 4-pager. The Kifs are illustrated to show their special features, and text, accompanied by photographs, tells how they are used. The bulletin contains both general and specific information on the features, uses, cost, and application of these Kifs.—BUFFALO PRODUCTS, INC., 315 BABCOCK ST., BUFFALO 10, N. Y.

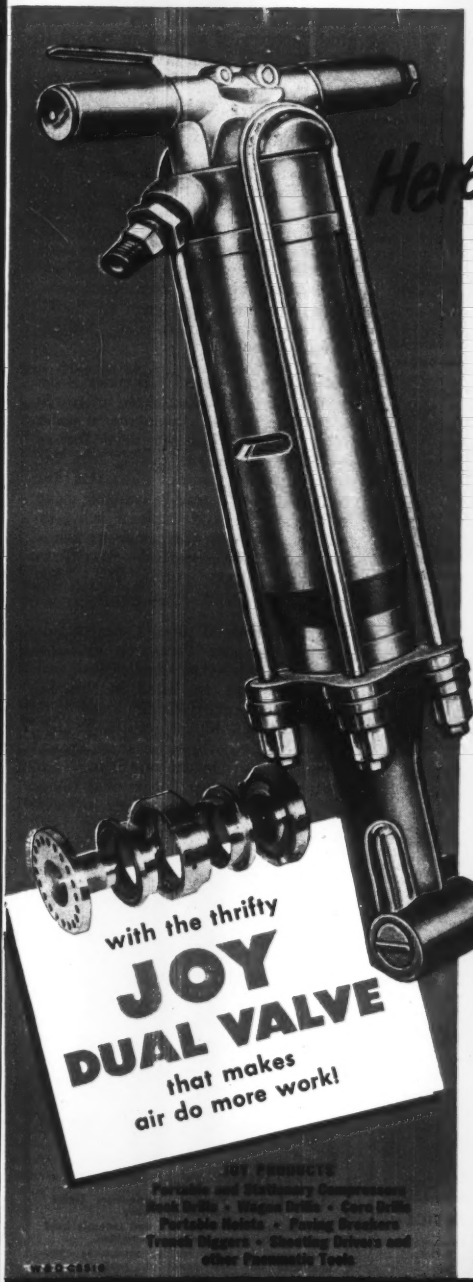
Non-return valve—Single-acting valve is described in a 6-p bulletin. Bulletin S-2 describes three different yoke assemblies on the elbow, angle, and globe bodies by detailed drawings and a complete list of parts. Adaptability, testing, construction, installation, sequence of operation, servicing, and specifications are fully described. Tables list general dimensions, shipping weight, and materials.—GOLDEN-ANDERSON VALVE SPECIALTY CO., 2094 KEENAN BLDG., PITTSBURGH 22, PA.

Water-tank pump controls—Pressure-operated pump controls that automatically maintain water levels in elevated tanks are described in 4-p Bulletin 1100. It features a description of the two-bellows design of the Autocon Tanktrol, and outlines results to be expected from this type of control. Thoroughly illustrated, the bulletin contains complete specifications and dimensions.—AUTOMATIC CONTROL CO., 1005 UNIVERSITY AVE., ST. PAUL 4, MINN.

Ditchers—Folder describes the Model 705-A Runabout service ditcher. A special feature of this bulletin is a table describing six typical tile and pipe types and diameters, matching these specifications with the digging widths (5½, 7½, and 10½ in) available with the Runabout. Also described in detail is the Hydra-crowd hydraulic transmission that provides an infinite range of digging speeds to 16 fpm and bucketline speeds of 380, 649, and 1,152 fum. All other features of the Runabout are fully described and illustrated. — BARBER-GREENE CO., AURORA, ILL.

Stud-welding power units—Detailed specifications and performance characteristics of two Nelweldер power units are contained in a 4-p bulletin. One is a small compact unit comparable to two conventional 400-amp

(Continued on page 102)



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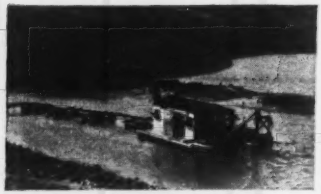

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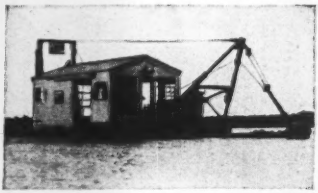

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generators in parallel for handling studs up to and including $\frac{5}{8}$-in. dia. The other is a battery unit with a self-contained automatic charging device. It handles studs to $\frac{1}{2}$ in.—NELSON STUD WELDING DIV., MORTON GREGORY CORP., LORAIN, OHIO.

Eye-safety guide—Revised issue of the "AO Eye Safety Guide" lists eye-hazardous occupations and recommended protection for specific eye hazards. Completely illustrated, it is designed as a reference chart and contains a summary of recommendations. Types of protective devices are listed.—AMERICAN OPTICAL CO., SOUTHBRIDGE, MASS.

"What Price Water?"—Booklet is designed to aid water-works men in presenting the case for increased water rates. It describes the need for an efficient water-works plant, lists the many uses of water, illustrates the convenience of a readily available clean water supply, and explains why increased funds are necessary to assure an effective water system.—AMERICAN WATER WORKS ASSN., INC., 500 FIFTH AVE., NEW YORK 18, N. Y.

Corrugated metal pipe—Types of full-round pipe and Pipe-Arch available for sewers, culverts, conduits, or irrigation systems are listed in this 16-pager. Reference data aids in selecting the most suitable structures. Photographs and case histories show typical installations. Details on fittings and instructions on installation of drainage structures are also included.—ARMCO DRAINAGE & METAL PRODUCTS, INC., GENERAL OFFICES, MIDDLETOWN, OHIO.

Pipe and bolt machines—Color folder pictures and describes features of Beaver pipe and bolt machines. Also listed are: Power drives, pipe cutters, and the Model 77 pipe threader for use with electric power drives.—BEAVER PIPE TOOLS, INC., 350 DANA AVE., WARREN, OHIO.

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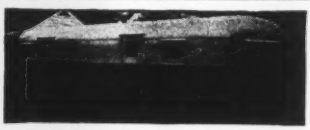

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Big Jim and safety first

Just outside of Chattahoochee, Florida, they are building the big Jim Woodruff Dam. When the project is finished it will have created a 37,500-acre lake and a shore line 243 miles long.

Ordinarily a project like this is highly dangerous. The dam is being built in an area of heavy rainfall. Workmen have to crawl over rock that gets a pasty film on its surface when wet. Hazards are increasing as a result of intensified concrete operations at high elevations.

Under these tricky conditions, and facing Florida construction industry accident costs to contractors and insurance carriers of about $270 an accident, Perini, Walsh, Mill & Blythe, Bros., contractors working on the dam, and U. S. Army engineers cooperated with the Florida Industrial Commission to start a series of safety classes training foremen in safety practices.

• **Built in safety** – Instructors pointed out the importance of building safety right into job training and work direction, as well as emphasizing management considerations of cost. (Indirect cost is estimated to be four times the amount of the direct cost in any industrial accident.)

In reporting on the effectiveness of the foreman training program, the contractors found their men receptive to the 10 hours of training, but noted that best results were to be had from direct safety training of the workers themselves.

Foremen are not unconscious of or insensitive to their responsibility for the individual men under them, but do need to be constantly reminded of safety questions on the job, according to C. C. Cannon, project engineer.

Most important, he noted, was the inverse relationship between accident frequency and the frequency of safety meetings.

• **A dandy score**—Result of this effort to build safety into the construction of the Woodruff Dam is an accident record unusual for a project so large and hazardous. Heavy construction such as this would ordinarily have resulted in around 176 lost time accidents at a cost to employers of $118,594—just for the period dating between July 1, 1949 and February 1, 1950.

In contrast to this is the record of only 25 lost time accidents during the first year and a half of construction work.

Between January 1, 1950 and January 1, 1951, of a total of 1,223,655 man-hours, only 5,032 man hours were lost as a result of accidents.

In the period July 1, 1949, to February 1, 1950, 400,000 man-hours were worked by 300 men without any lost time accident.

In 1950, a similar stretch of safety consciousness helped the record along between the dates July 25 and September 1. During that period 125,000 man-hours were worked without mishap.

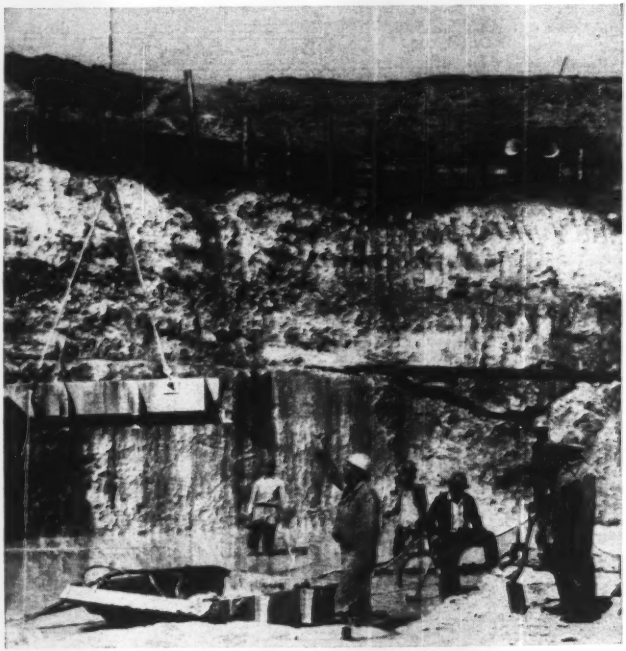
The course given 24 foremen of the dam site project was taught by a representative of the Florida Industrial Commission. Text for the course was the commission's manual *Foremen in Safety*.

• **Text book on safety**—Big emphasis of the booklet is the training of new workers in safe practices—to build safety into the job itself.

Special attention was given in classes to the sources of accidents in heavy construction work. These were derived from accident records of 1948 and 1949. Activities around drag lines were studied, as well as the problems of handling earth moving equipment, explosives, temporary wiring, material and water transportation.

• **Extra push asked**—Supervisors were urged to look ahead, to "see an accident coming" and to inspect with safety in mind.

"The management of the associated contractors on this project may be quoted as stating that there is a direct value to be realized on this or any similar job from the Commission's 10 Hour Safety Course, as it fills a need to bring home to the operational personnel the very grave problem . . . personal anguish from the necessarily hazardous work involved in this type of operation," writes Cannon.



ALL MEN STAND CLEAR—for the signal is given as an overhead load of limestone takes to the air. If alert to signals, workmen do not get hurt from overhead loads. Work in process on the Jim Woodruff Dam at Chattahoochee, Fla., is safer because of an unusual safety course given by the Florida Industrial Commission.

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The material used to fill voids was a Texaco Asphalt of 25-35 penetration, which road builders have pumped under a substantial mileage of old concrete and found ideal for the purpose. Approximately 105,000 gallons were needed to fill all voids under this 21-mile highway.

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